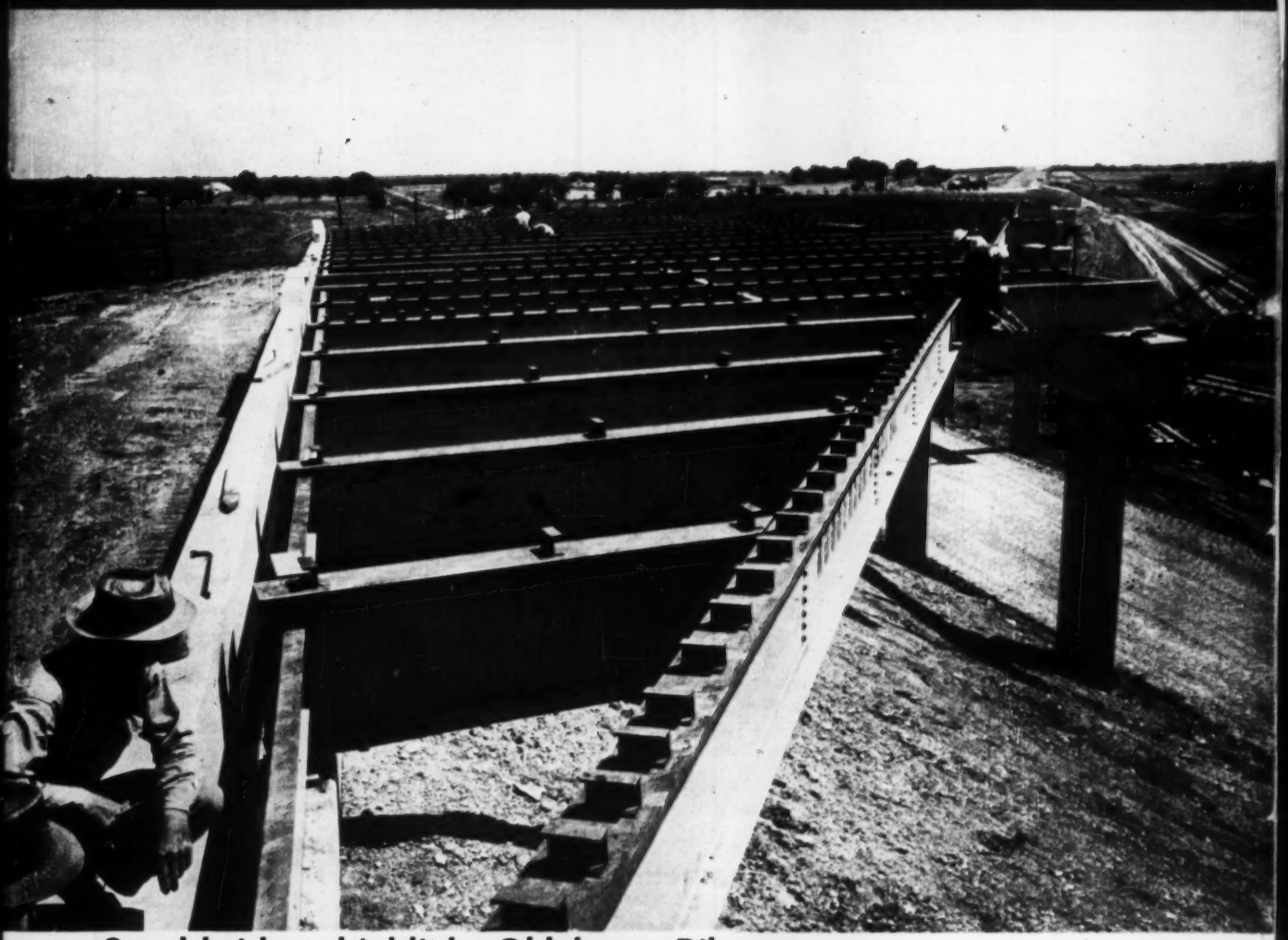
ENGINEERING NEWS-RECORD

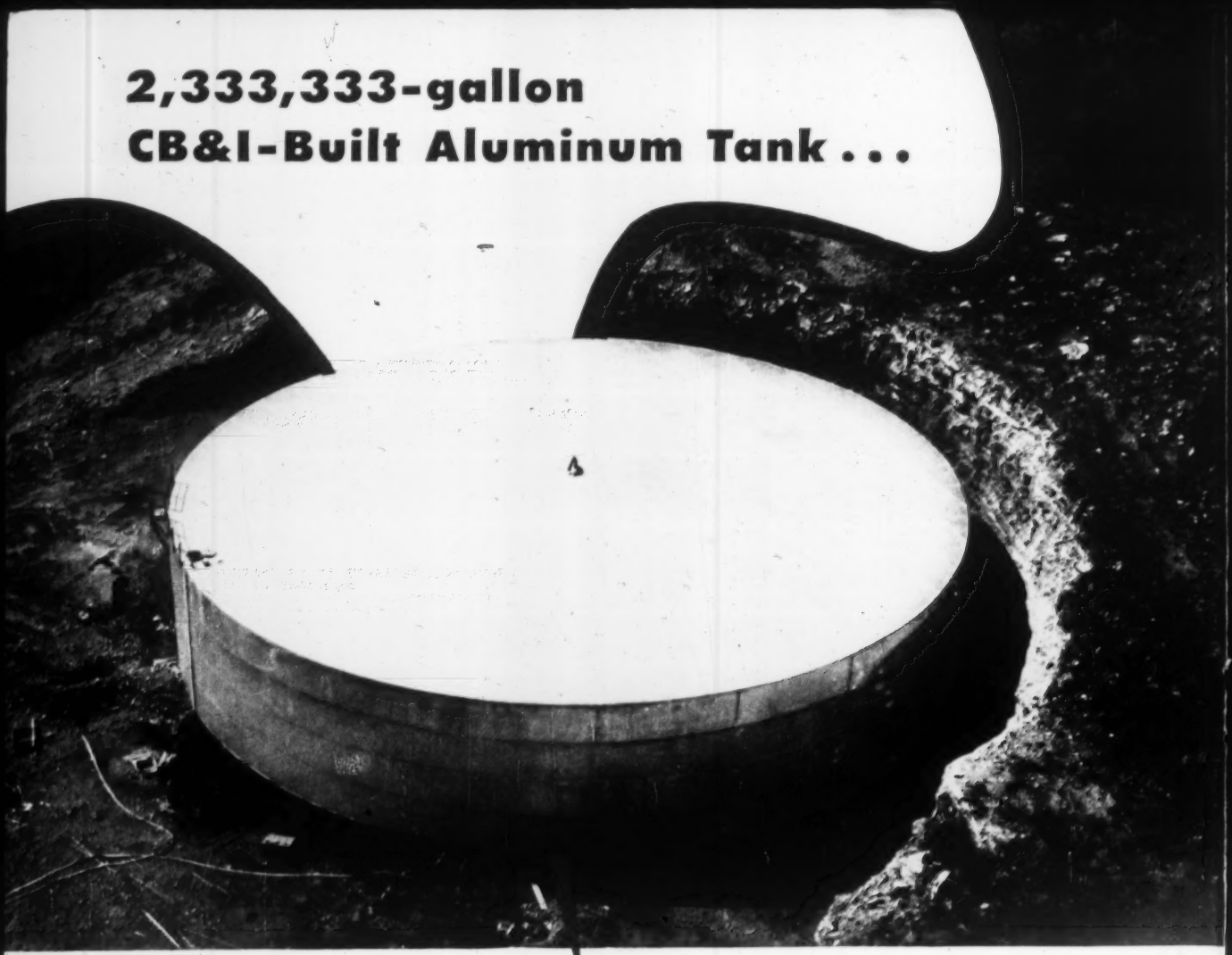


Steel bridges highlight Oklahoma Pike *p. 32*

A McGRAW-HILL PUBLICATION

E B POWER
UNIVERSITY MICROFILMS IN
313 N 1 ST
ANN ARBOR MICH

2,333,333-gallon CB&I-Built Aluminum Tank . . .



stores 83% ammonium nitrate

It's the world's largest all-aluminum tank. 120 ft. in diam. by 26 ft. high and constructed of more than 300,000 lbs. of Alcoa aluminum, it was fabricated and erected by Chicago Bridge & Iron Company for the Mississippi River Chemical Company at Selma, Missouri. Providing storage for 2⅓ million gallons of 83% ammonium nitrate, it provides Mississippi River Chemical Company uninterrupted storage service with a minimum of maintenance.

Chicago Bridge & Iron Company has complete facilities at four plants to design, fabricate and erect special and standard plate structures of steel or other special metals to meet your most rigid specifications.

When *you* plan structures, write our nearest office . . . *and plan with CB&I.*

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Over ¼ mile of pipe in one truckload!

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Light weight also makes Beth-Cu-Loy easy to handle when loading, unloading, or installing at the site. In smaller diameters it can usually be handled manually and even larger sizes rarely require expensive, heavy lifting equipment.

Yet light as it is, pipe made of Beth-Cu-Loy is strong because it's steel. Flexible, too, so that it flexes with the fill to help distribute the load peripherally. It conforms well to grade and alignment, and absorbs vibration, impact and the shifting effect of weather changes. Its copper content plus tight zinc coating make Beth-Cu-Loy corrosion-resistant.

Trenching for Beth-Cu-Loy pipe is less costly, for the trench need be only wide enough to admit the pipe. There is less earth to remove, less to replace. No breakage to allow for, either, with corrugated galvanized steel!

Beth-Cu-Loy galvanized sheets conform to the rigid specs of the American Association of State Highway Officials. If you would like further details about Beth-Cu-Loy for drainage purposes, just get in touch with any Bethlehem sales office, or with one of the fabricators using our culvert sheet steel stock, whose names we will gladly supply.

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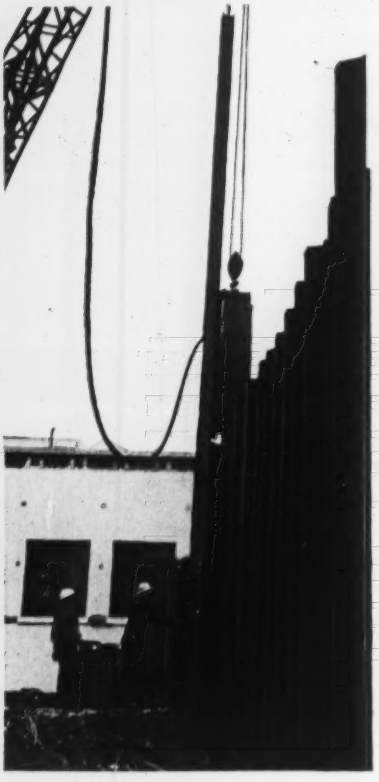
At 3 P.M....

CAVE-IN!



Cave-ins will happen, through no fault of the contractor. On this excavation job, there was erratic soil behavior, shifting loads, saturating rain . . . everything unpredictable.

When it happened, L. B. Foster Co. was called at 3 P.M. for rental steel-sheet piling *in a rush*. We cut MP-116 piling in our yard, and delivered it in Foster trucks to the job site 400 miles away before the crews started work next morning.

This is typical of the dependable help contractors can expect . . . and get . . . with Foster's Piling Rental Plan. Always the exact length and exact section . . . when you need it . . . on low fixed cost. Call your nearest Foster office for quotations—find out for yourself the real savings in Renting Piling from Foster.

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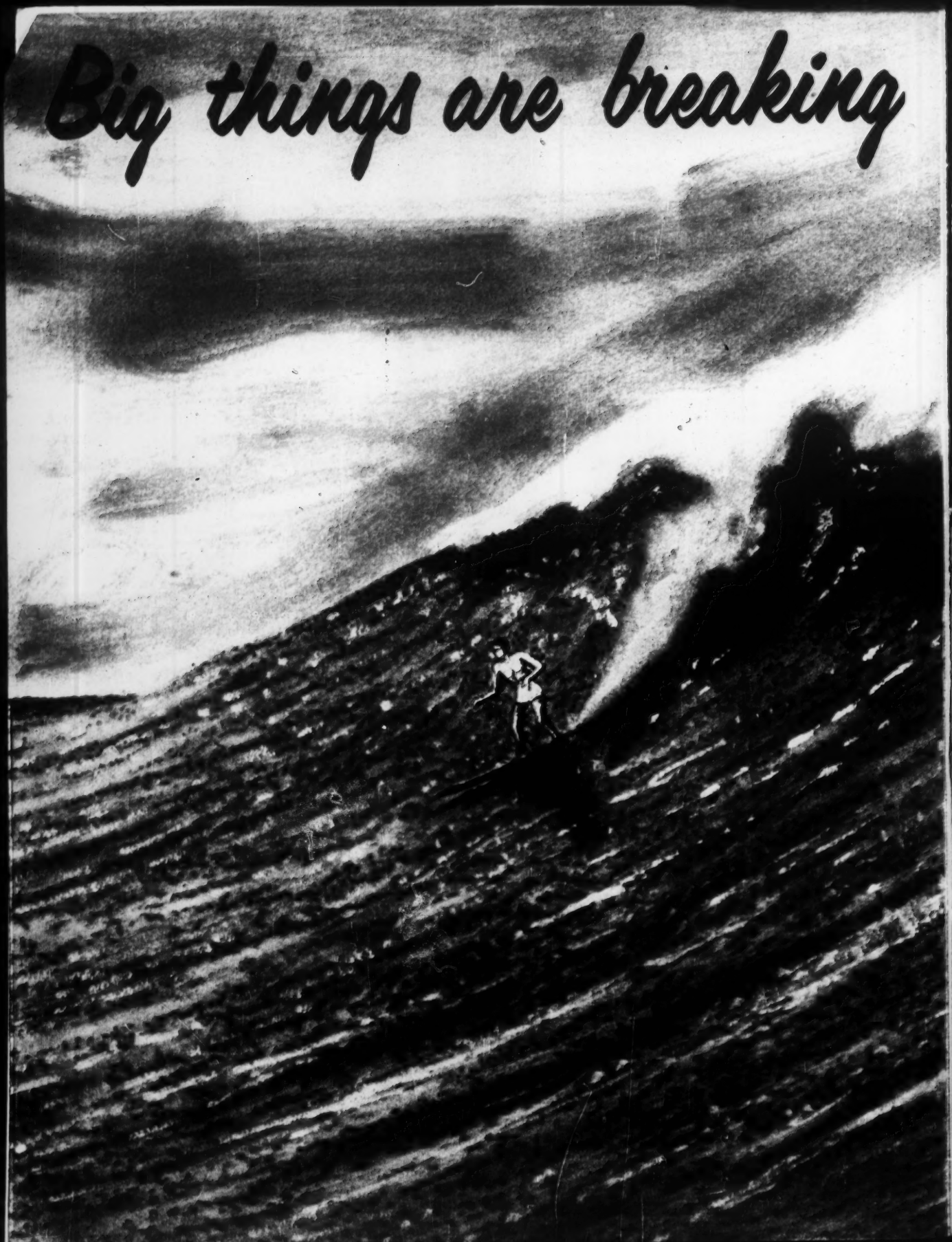
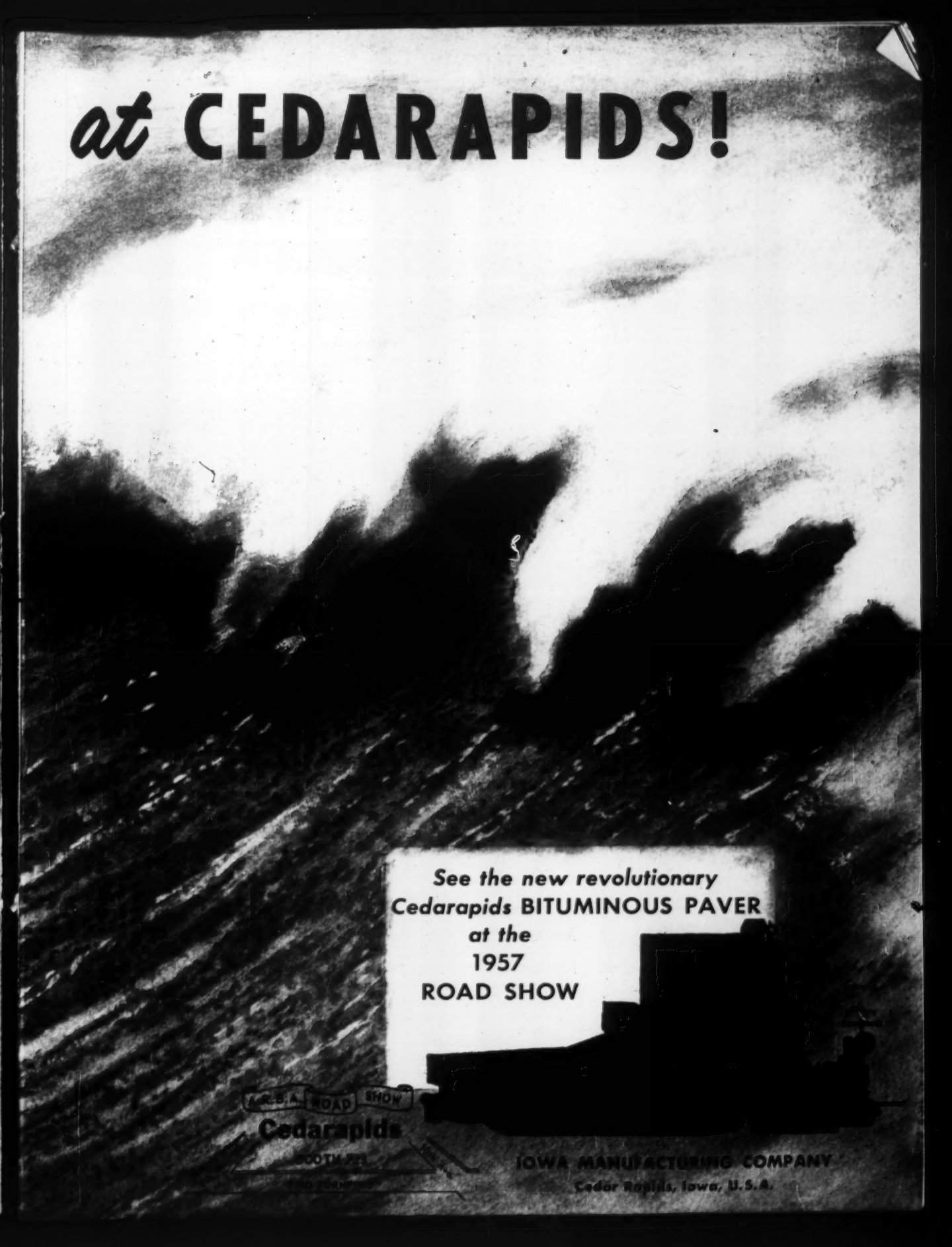

Big things are breaking

at CEDARAPIDS!



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Reader Comment

Skyscraper Built With Shale

SIR—I should like to correct the description in ENR Nov. 29, 1956, p. 26, of the lightweight aggregate used on 10 East End Ave., New York City. It was not expanded slag, but Lelite, an expanded shale, as specified by Robert Rosenwasser, structural engineer. The Lelite concrete used was specified to have a minimum strength of 4,000 psi for columns and 3,000 psi for slabs.

I should also like to point out that most of the lightweight structural concrete in New York City for the past several years has been made with Lelite.

WILLIAM W. KARL
Division Sales Mgr.
Lehigh Materials Co.
New York, N. Y.

Inflection-Point Stresses

SIR—The letter from E. M. Rensaa (ENR Nov. 1, 1956, p. 10) effectively pin-pointed the cause of the recent difficulties with reinforced concrete rigid frames.

It is my opinion that the center portion of the horizontal member of a rigid frame is, in effect, suspended at the inflection points. If we assume a length of beam one-half *d* on each side of the point, the compressive stresses in the area are so low that they assist only slightly in keeping the compression zone uncracked. And when a crack forms, the web steel must take all the shear. In other words, with no horizontal forces, or only nominal horizontal forces, at the inflection points, we have virtually the full vertical resultant shear acting.

A few weeks ago I had occasion to design a concrete rigid frame spanning 140 ft. At the inflection points the unit shear calculated by the usual formula was 73 psi, which, according to building codes, would require no stirrups. However, with the center portion of the horizontal member considered suspended at these points, and neglecting tension in concrete, it was necessary to use 5.45 sq in. of tensile steel. Since it is not reasonable to have all this steel at one point, it seemed logical to provide closely spaced stirrups having a total area of 5.45 sq in. over a distance of about two times the beam depth, the center of this distance being the point of zero moment. Stirrups at other points were, of course, calculated by conventional methods.

I also found that shrinkage and temperature stresses added materially to the critical condition at the inflection points.

No doubt we have a similar situation in all concrete beams, but it does not become serious in relatively short spans, particularly where the floor or roof construction is monolithic with the beam.

It is interesting to note that the difficulties with long-span frames have occurred, so far as I know, where there were no bent-up bars. Therefore, it is my opinion that to make concrete rigid frames of any span safe, all that is necessary is to provide some means of suspension at or near the inflection points, whether it be bent-up bars or stirrups. It is also vitally necessary to consider carefully the full effects of shrinkage and temperature stresses.

I. E. MORRIS
Consulting Engineer
Morris, Boehmig & Tindel
Atlanta, Ga.

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Deeper Rolled Beams Needed

SIR—The shortage of structural steel already is becoming acute with the great new highway program only beginning to swing into motion. It seems apparent that the steel producers are not prepared or planning to increase the output of structural shapes sufficiently to meet this obvious demand. While that problem may have ramifications beyond engineering requirements, I believe that serious consideration should be given to augmenting the list of available shapes, especially wide-flange beams.

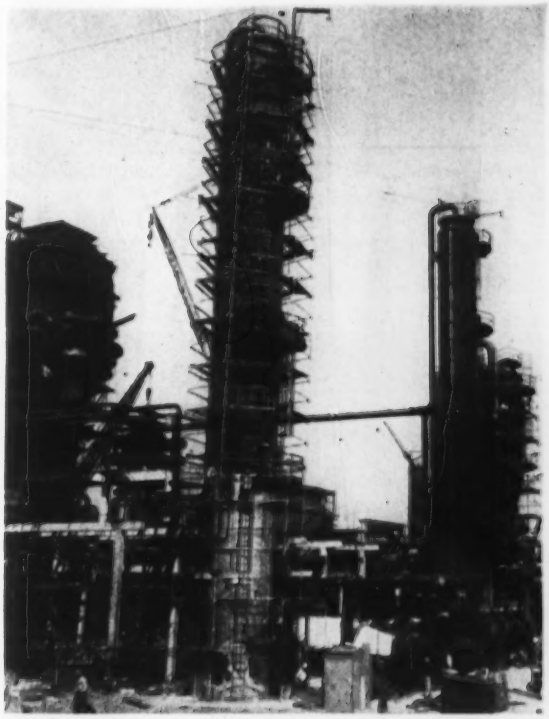
From stress and deflection considerations, the largest 36-in. beams are not suitable for spans over 90 ft. Yet, with the improved standards being developed for interstate roads, there will be a large segment of rather typical bridges that will require clear spans of 100 ft or more. If such spans can be accomplished with rolled beams, we may even see the virtual elimination of piers at the outside shoulders of roadways and fully open side spans extending to perched abutments.

Therefore, I suggest that the steel producers roll beams of 39 and 42-in. depths. These are common in Europe.

(Continued on page 12)

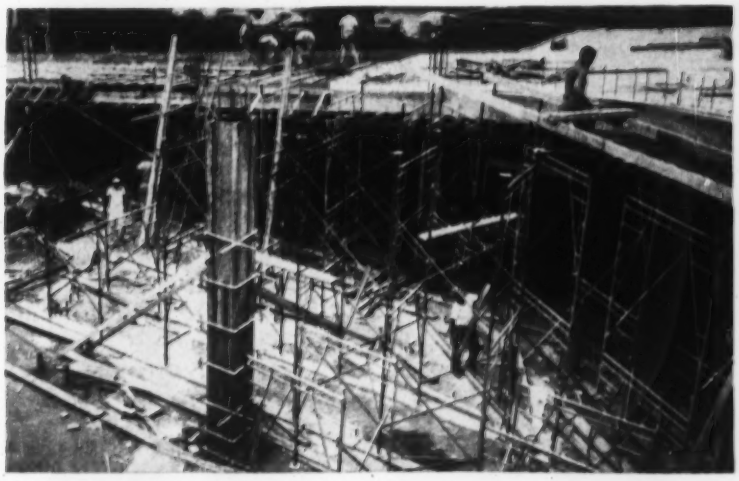
Scaffolding Methods . . .

A Picture Report on Efficient Ways To Scaffold and Shore... by Patent Scaffolding Co.



BIG REFINERY JOB — Nearly 15 miles of "TubeLox"® Steel Scaffolding and 3,500 "Trouble Saver"® Sectional Steel Scaffolding frames are used by C. F. Braun & Co., contractor, to get safe, sturdy working platforms for building the new Tidewater Oil Co. Delaware Flying-A Refinery, Wilmington. Note how "TubeLox" Scaffolding provides easy access all over the 155'-high depropanizer column, center.

CLOSE-UP — "Trouble Saver" Sectional Steel Scaffolding surrounds an oil storage tank at the construction scene of Tidewater Oil Co. Delaware Flying-A Refinery, Wilmington. Workmen get close to apply exterior insulation.



SLOPING FORMWORK SUPPORT — Formwork for the concrete pan joist construction of the sloping vehicle ramp at the Arnold Constable Store, New Brunswick, N.J., is supported by 5'-wide "Trouble Saver" Sectional Steel Shoring frames. 160 2'-wide Ladder Scaffolds are also used to support 18"-deep beams varying from 30" to 54" wide. James Mitchell, Inc., is the general contractor.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

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PRY-ACTION BREAK

gets you jobs other

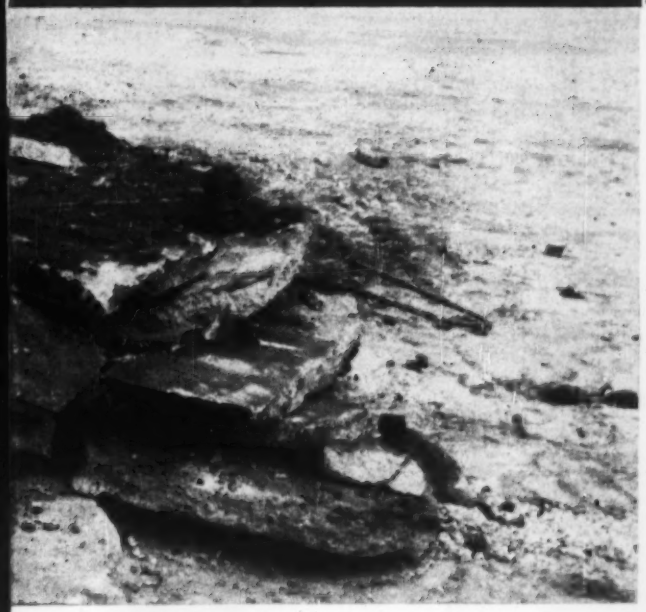
Contractor Leon Sumler, Jackson, Tennessee, applies exclusive triple-power pry-action break-out with his TD-9 Four-In-One Skid-Shovel. And without delay, he breaks-up, and yanks-up an old filling station's concrete slab and footings!

This new 3-yd. TD-18 Four-In-One Skid-Shovel proved able to do as much as 3 power shovels and a dragline—excavating and loading up to 1,700 lineal feet of old concrete pavement daily—operating for Henry E. Berghuis, Prinsberg, Minn.

Street-widening and regrading calls for removing old concrete pavement—which the new TD-9 Skid-Shovel is loading out at 600 cu yds per day! Dennis Widmer, Portland, Oregon, owns this outfit with the job-getting break-out power!

-OUT...

rigs can't do!



Thirty-six times as fast as 3 men and a jack-hammer could do it—this TD-14 *broke-up, dug-out, and loaded* 180 lineal feet of old one-by-four-foot concrete wall, in only 4 hours! Owner: Anderson Trucking and Excavating, Inc. Buffalo, N. Y.

Pry-action break-out force ranges from 12,000 lbs. on the International Drott TD-6 Four-In-One Skid-Shovel—to 27,000 lbs. on the TD-18 model. For special applications like land-clearing, the TD-18 model can be equipped with larger hydraulic cylinders to develop 54,000 lbs. of break-out!

Patented and exclusive International Drott pry-over-shoe break-out action gives you *up to six times as much excavating power* as ordinary front-end loaders can deliver! Only an International Drott gives you this multiplied force of the scientific lever principle acting over big skid-shoes, and teamed with ground-level bucket roll-back. *No other loader even has skid-shoes!*

Only International Drott-developed reverse cylinder action produces the tremendous hydraulic power for pry-action break-out. And this pry-action principle shunts shock-stresses directly into the ground—so they can't maul loader or tractor.

Measure the job-getting, capacity-adding advantages of exclusive triple-power, pry-action break-out. Note how exclusive parallelogram raise action keeps the bucket level, all the way up—reduces spillage—increases your daily yardage up to 18%! Prove that exclusive, shock-swallowing Hydro-Spring protects equipment, adds operator comfort. And try the exclusive International Drott Four-In-One that *gives you four-machine utility* for one moderate investment—in your choice of four sizes, one-yard to three-yard capacity. See your International Drott Construction Equipment Distributor for a demonstration.

A tough oak tree with 22-inch trunk is uprooted with the tremendous pry-action break-out—applied by TD-14 using grubber blade attachment, instead of bucket. Owner Lester H. Davis, Bennington, Vermont, is clearing farm land.

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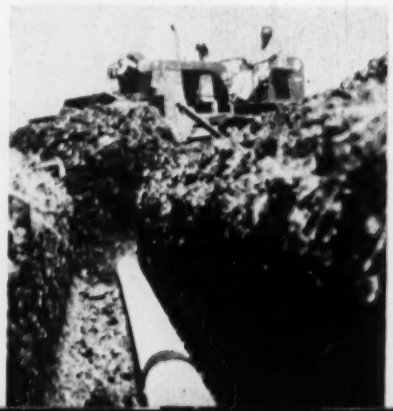
BUILDING FIRE WALLS IN LIBERTY. One of ten TD-14 tractors, recently purchased by Brown and Root, builds roads, flood dikes, and clears land for new well sites. New TD-14 provides genuine "in-seat" starting!

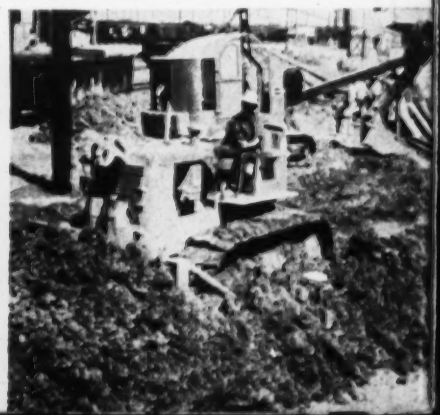
SPREADING AND COMPACTING IN HOUSTON. TD-14 with both ends busy, spreads fill and compacts it at the same time with a sheepsfoot roller. Construction is for preparation of new Juvenile Detention Home site for Harris County.

SPREADING FILL IN HOUSTON. This TD-14 levels land on 360-acre naturalistic park, on south shore of Lake Houston. The new bonus-powered TD-14 has new bridge-strong box-beam track frames—for big-capacity, tough-material dozing!

BACKFILLING TRENCH IN TEXAS CITY. A 74-mile long, 8-inch pipeline from Hull to Texas City undergoes its last operation with another TD-14. Cerametallic engine clutch facings reduce operator effort and prolong clutch life in fast "shuttle-dozing" like this!

REPLACING PIPELINE IN HOUSTON. Stationed near home, this TD-14 joins a trench-hoe to move muck for pipeline replacement in railroad yard, at Sheffield Steel Company. In muck, mud, or water, new track roller seals save inspections...exclude grit, retain lubricant.





TD-14's

BROWN AND ROOT RADIO-DISPATCHED TRUCK with International TD-14 gets "go-ahead" from dispatcher. Because of modern methods, Brown and Root TD-14's can be on the job anywhere in East Texas in just a few hours. No special haulage permit needed to transport the easy-to-truck TD-14!

International TD-14's give big contractor "middleweight" mobility and heavy work *power-punch*... to profitably finish jobs fast!

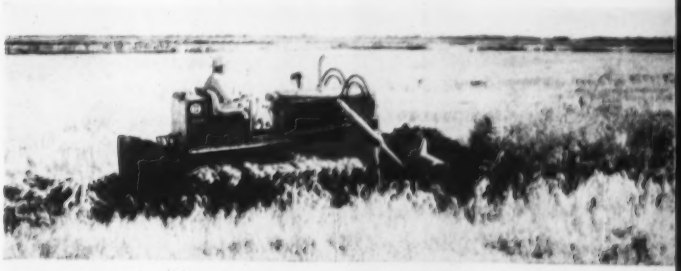
Internationally-famous contractor, Brown and Root, Inc., take the tough jobs wherever they are, from Guam to Guatemala—from Alaska to Calcutta. On work requiring 70-80 dbhp, they have purchased more than 225 International TD-14 crawlers to get unmatched job-to-job mobility and big capacity.

Another big reason for this choice, the TD-14 starts seconds-fast in all weather with famous International gasoline-conversion diesel starting. It's on the job fast without profit-gobbling delays!

Another big reason, new built-in operating ease, control tower visibility, hydraulic booster steering, clean geared-for-action deck, adjustable deep-cushioned seat. ALL add job-getting efficiency and cost-cutting capacity!

Other reasons: low operating cost; servicing ease! The heat-defying new Cerametallic engine clutch facings increase life, save adjustments! Famous micrometric fuel pump precision saves fuel, postpones overhauls. New track-roller seals hold greasing to 500-hr. intervals!

Reasons like these are why contractors everyhere are standardizing on bonus-powered International crawlers! Try one on your next job. Your International Construction Equipment Distributor will gladly demonstrate!



BREAKING DOWN RICE LEVEES IN ANAHUAC. Not all of Brown and Root Corporation's TD-14's work on industrial projects. This one tears down rice levees on a special assignment when oil field or other work is slack.

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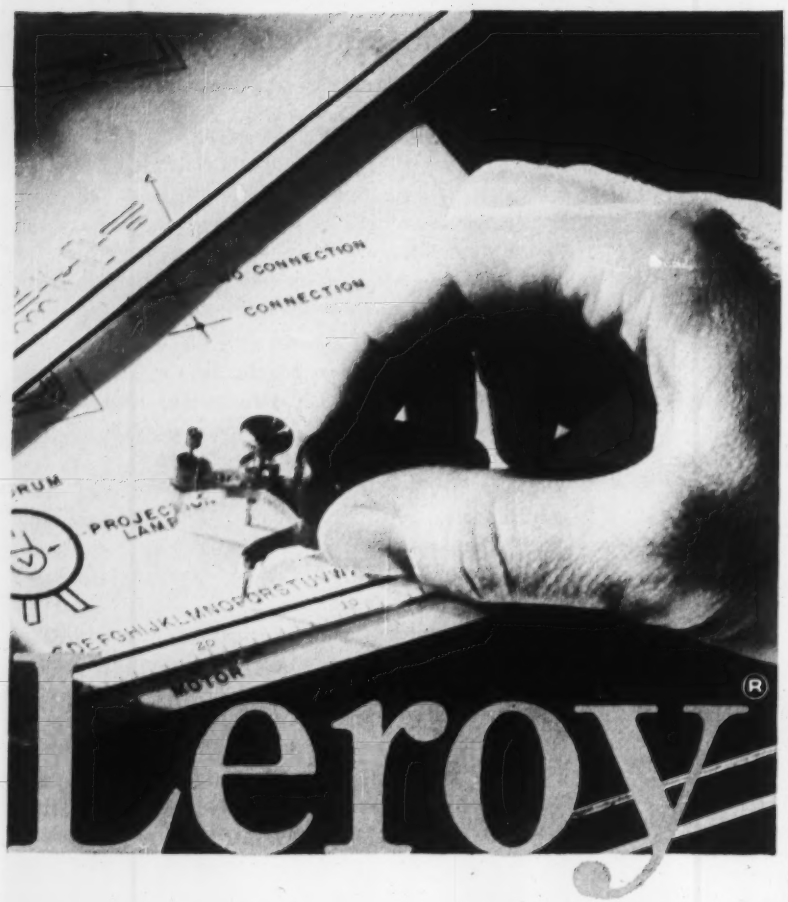
INTERNATIONAL Construction Equipment



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. . . Reader Comment

Of course, the exact proportions of the members will require extensive study, but I believe that the production problems involved in rolling deeper beams can be readily overcome.

The engineering profession must expect the steel industry to produce more useful members as an important assist in completing our mammoth highway system.

DONALD R. GOODKIND
Consulting Engineer
Goodkind & O'Dea
Bloomfield, N. J.

Wrong Consultant Named

SIR—I noticed with surprise that, in an article in ENR Nov. 29, 1956, p. 26, "Tallest Lightweight Concrete Building," you credited me with being the consulting engineer for the project. This is not true.

The consulting engineer is Robert Rosenwasser, who designed and prepared all the structural engineering plans in his own office. My own function in connection with this project is that of supervising engineer for the lending institutions.

VICTOR MAYPER
Consulting Engineer
New York, N. Y.

CALENDAR

Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 7-11.

Seventh Annual Sanitary Engineering Conference, University of Kansas, Lawrence, Kan., Jan. 8.

Society of Plastics Engineers, Inc., 13th Annual National Technical Conference, Hotel Sheraton-Jefferson, St. Louis, Mo., Jan. 16-18.

Engineers Joint Council, Third Annual Assembly, Jan. 17-18, with Assembly Dinner evening of 17th. Reservations: EJC, 29 W. 39 St., N.Y.C. Place: Hotel Statler, N.Y.C.

National Association of Home Builders, annual convention and exposition, Hotel Sherman, Hotel Conrad Hilton and Coliseum, Chicago, Ill., Jan. 20-24.

Associated Equipment Distributors, 38th annual meeting, Conrad Hilton Hotel, Chicago, Jan. 27-30.

American Road Builders Association, annual meeting and road show, Chicago Amphitheater, Jan. 28-Feb. 2.

Reinforced Plastics Div., Society of the Plastics Industry, Inc., 12th Annual Technical and Management Conference, Edgewater Beach Hotel, Chicago, Ill., Feb. 4-7.

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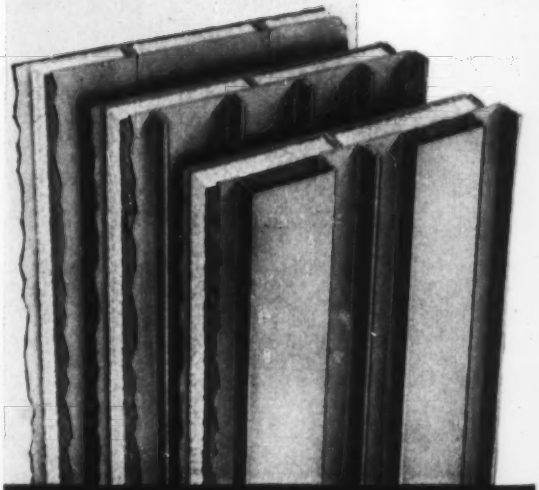

FLUSH, RIBBED, or FLUTED
Over-all "U" Factor is Superior to a Conventional Masonry Wall with Furred Lath and Plaster

In recent years, architects have employed Mahon Insulated Metal Curtain Walls skillfully and to good advantage, costwise, in producing some outstanding design effects in buildings of virtually every type—including some monumental buildings. Bright metal—aluminum or stainless steel—in combination with brick, ornamental stone, glass block or other materials, offers unlimited possibilities in architectural treatment of exterior design. The building below is an excellent example. Mahon Insulated Metal Curtain Walls are light weight, permanent construction. Erection is fast . . . buildings can be quickly enclosed with metal curtain walls—even under low temperature conditions. They are economical, too . . . savings amount to as much as 50% of the cost of masonry walls in some types of buildings. Mahon walls are available in the three patterns shown at left. In the "Fluted Wall" and the "Ribbed Wall", vertical joints are invisible—symmetry of pattern is uninterrupted across the wall surface . . . and, both of these walls can be erected up to sixty feet in height without a horizontal joint. These two design features—extremely important, particularly in powerhouses and other buildings where high expanses of unbroken wall surface are common—were engineered into Mahon Insulated Metal Walls to give you a finer appearing job free from unsightly joints. You'll want these "better look" features in the wall you select for your next building. See Sweet's Files for information, or write for Catalog W-57.

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Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities

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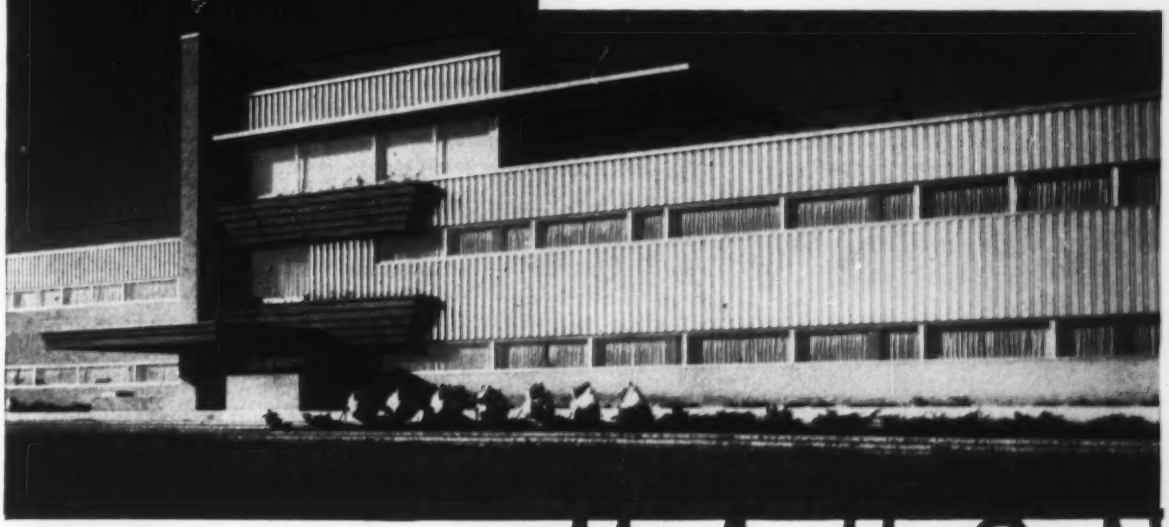

Office and Plant of the Schlumberger Well Survey Corporation, Houston, Texas. 20,000 sq. ft. of Mahon Aluminum Curtain Walls were employed in this project. Mackie & Kamrath, Architects. Tellepsen Construction Co., General Contractors.

MAHON

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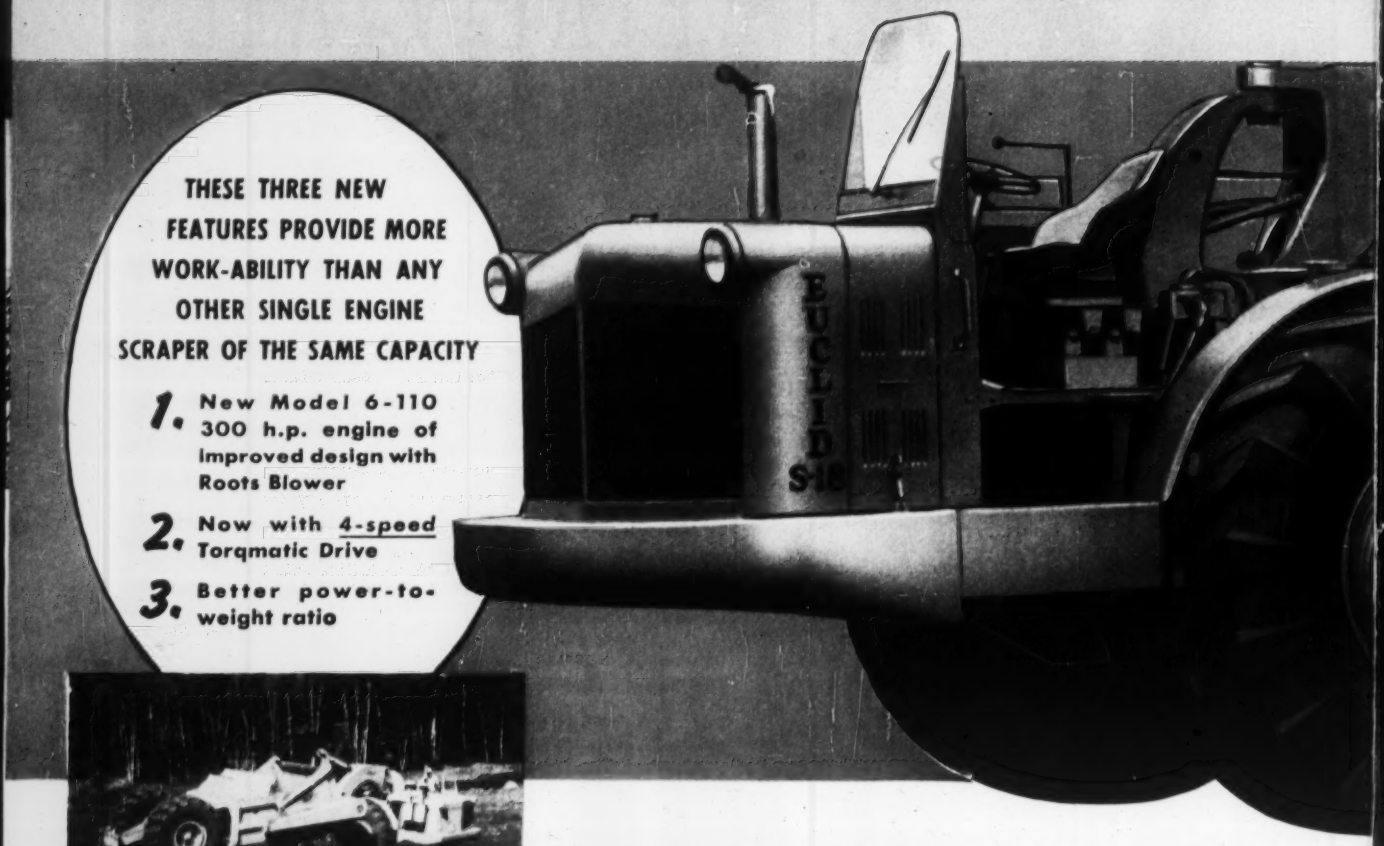


THESE THREE NEW FEATURES PROVIDE MORE WORK-ABILITY THAN ANY OTHER SINGLE ENGINE SCRAPER OF THE SAME CAPACITY

1. New Model 6-110 300 h.p. engine of improved design with Roots Blower
2. Now with 4-speed Torqmatic Drive
3. Better power-to-weight ratio

Improved full hydraulic steering gives the S-18 still better maneuverability and ease of handling. In spite of its size, this scraper makes a non-stop turn in only 36'. Hydraulic lever action of bowl, apron and ejector eliminates down time caused by cable breakage.

Torqmatic Drive with new 4-speed semi-automatic transmission, 300 h.p. engine, big tires, NoSpin differential and low, wide bowl provide fast, easy loading in any scraper material. The 4 section cutting edge is reversible and interchangeable—it's adjustable for varying job conditions.

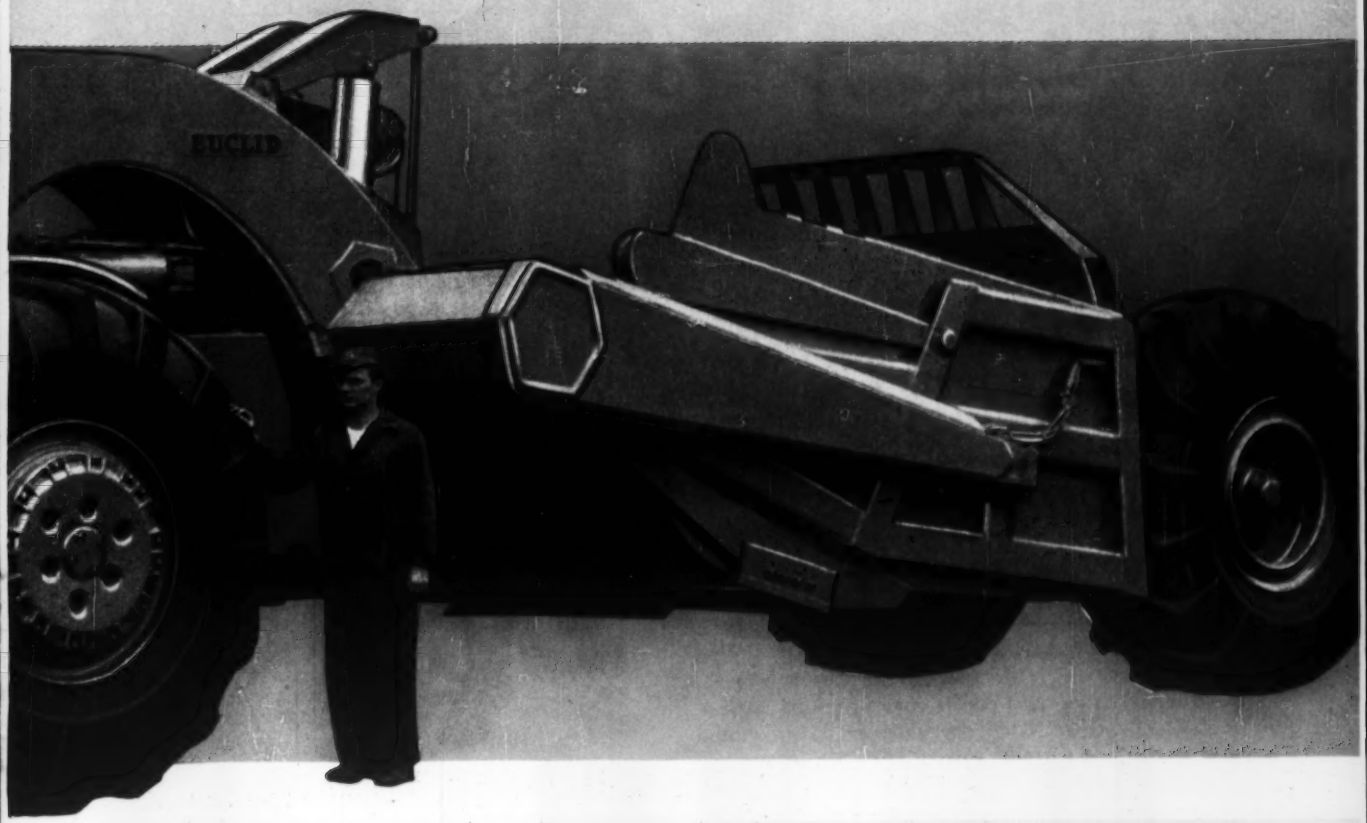
A big machine for big jobs, the Model S-18 Euclid Scraper has proved its ability to outperform comparable scrapers in productive capacity and low cost yardage. Now it has even more built-in performance with an improved power-to-weight ratio, and easier operation and accessibility than before. This new S-18 will surpass its previous high production records.

The improved 300 h.p. engine and new 4-speed Torqmatic Drive give still better performance in the lower speed ranges that are so important to efficient scraper operation. Simplified design of the engine with the Roots Blower reduces maintenance time and costs and gives more durability and fuel economy. With the 4-speed semi-automatic transmission there's a better range of speed and torque for every scraper power requirement . . . from the maximum torque needed for loading to the higher speeds used on the haul road.

Already preferred by many leading contractors because of its greater work-ability, this new S-18 incorporates many important improvements. Your Euclid dealer will be glad to explain these new features and cost-cutting advantages and show you why *Euclids are your best investment.*

See the new S-18 at the Road Show!

the improved EUCLID S-18 SCRAPER



Faster cycle time with Torqmatic Drive—there's no clutching or loss of speed when changing from one speed range to another. Top speed with heaped loads up to 25 yds. is over 20 mph. Short overhang of the engine gives good stability for rough going and long, high speed hauls.

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ENGINEERING NEWS-RECORD

Vol. 158 No. 1 January 3, 1957

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 15¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

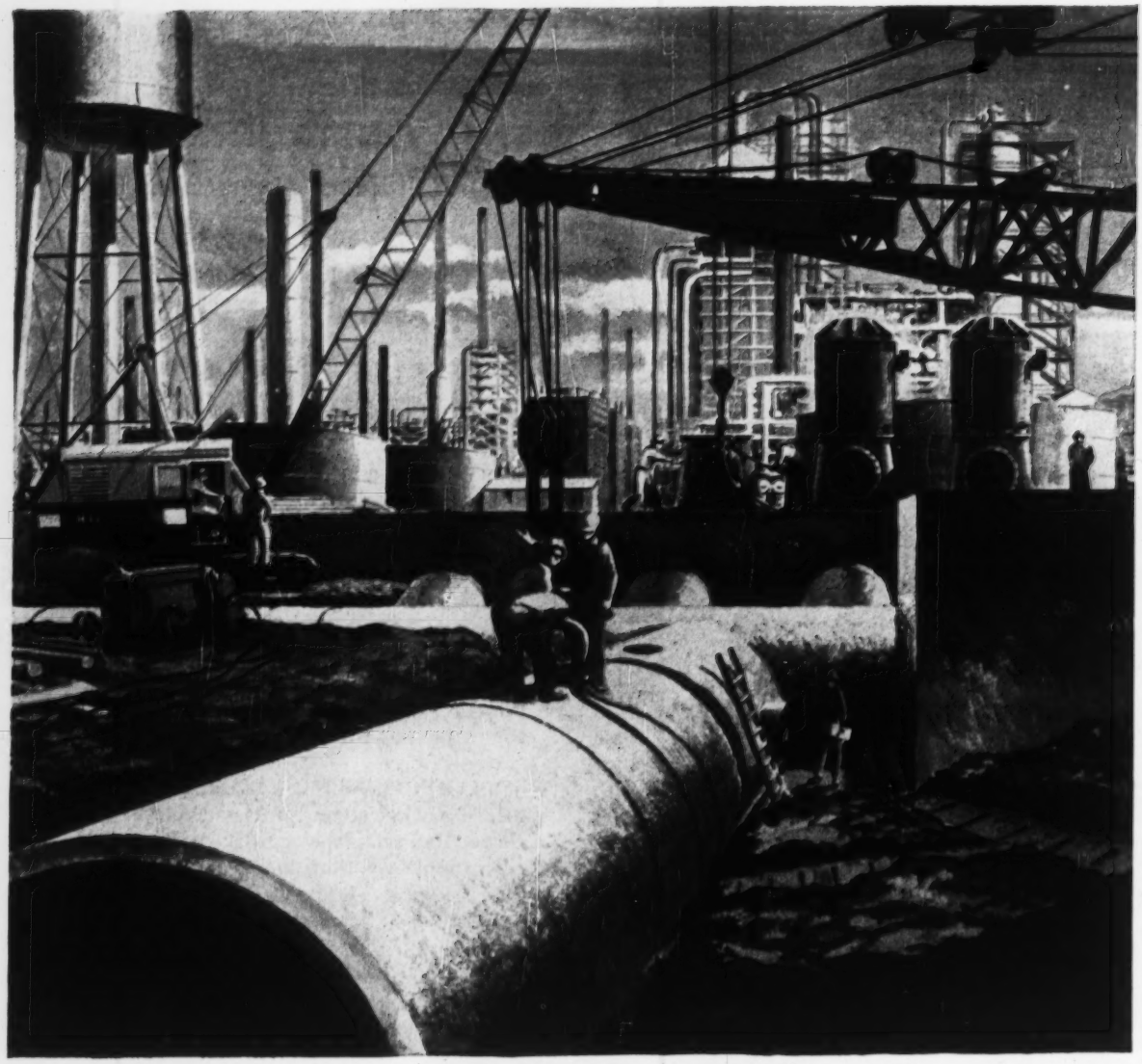
THE CONSTRUCTION WEEK

BROADER EUCLID LINE?—Construction equipment circles buzzed last week with the rumor that General Motors has told Euclid dealers to drop competing machines at an early date. Obvious guess: Euclid will come out with new equipment to round out its line. GM had no comment on the report.

SPRINGTIME IN THE ROCKIES—An optimistic forecast that Pacific Northwest Power Co. may begin its two planned Snake River dams in the spring was issued by President Kinsey M. Robinson to stockholders in Washington Water Power Co., one of the PNP member firms. The two dams, Pleasant Valley and Mountain Sheep, are covered in PNP's license application on which the Federal Power Commission has now completed hearings. Robinson's optimism is based on an apparent belief that a favorable finding will be forthcoming from FPC before spring. However, this all depends on whether the Interior Department intervenes with the proposal that a high Pleasant Valley dam be built. Such federal action is still quite likely (ENR Dec. 20, 1956 p. 19).

NEW LOOK IN A-PLANTS—Britain's first three commercial nuclear power plants will pale the spectacular Calder Hall prototype (ENR Oct. 25, 1956, p. 48) in comparison. All three are to go under construction early this year. The largest, and most advanced, is to be a 360,000-kw plant at Hunstanton, Scotland. Its reactor vessel will be 70 ft in dia, operate at 150 psi and have a double shell. The outer layer, of 3-in. boiler plate will take the pressure while the inner and thinner shell will provide heat protection to minimize site fabrication and welding problems. The other two plants are to have only slightly less installed capacities and lower operating pressures.

REVIEW AND FORECAST—The Tennessee Valley Authority annual report released Jan. 1 states the agency's year-end situation and expresses serious concern for its future. In 1956, turning to its power revenues for construction money, TVA brought near to an end the defense expansion of its system that has added six million kilowatts of power in six years. With most of this added power in steam plants, TVA has become the nation's No. 1 buyer of coal; steam plants now carry 72% of its load. With its current program completed, TVA will have a total (nameplate) capacity of 11.2 million kw, but even with that, a power shortage is foreseen for the area by 1959 or 1960. "Power revenues will not provide sufficient capital to meet more than a part of the region's power requirements," says the report, "TVA must have other sources of funds."



Where OIL and WATER do mix!

It takes a staggering amount of water to run an oil refinery such as the one recently built for the Tidewater Oil Co. at Delaware City, Delaware. Specifications required twin 78" LOCK JOINT REINFORCED CONCRETE CYLINDER PIPE-LINES to supply water to this plant. The combined capacities of these two lines would satisfy the normal requirements of a city of over two million population.

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WASHINGTON OBSERVER

Key construction men in the new Congress are mainly those who were in charge of programs during the past two years. Mostly, they're in favor of programs that put more federal dollars into construction.

Highway legislation will continue to be under Sen. Albert Gore of Tennessee, and Cong. George Fallon of Maryland. Gore will push his fight for a three-man highway commission outside of the Commerce Department to run the huge construction program.

School construction will be influenced by Alabama's Senator Lister Hill and Rep. Graham Barden of North Carolina, both of whom are sensitive to the segregation issue which will be raised even sharper this session than during the last.

Stream pollution will be under Rep. John Blatnik of Minnesota, who will press for more money for sewage treatment construction.

Public works will benefit from the big spending inclinations of Sen. Dennis Chavez of New Mexico, chairman of the Senate committee, and Rep. Clarence Cannon of Missouri, who will head up the special appropriations subcommittee on public works he created last year to pump up funds for federal reclamation and power projects.

Reclamation and power will have as advocates Rep. Clair Engle of California, chairman of the Interior Committee and Sen. James Murray of Montana—both favoring federal construction right across the board instead of the Administration's partnership approach.

Housing emphasis will remain about as before, with Rep. Brent Spence of Kentucky as head of House Banking Committee. Public housing foe Rep. Jesse Wolcott of Michigan won't be back. The Senate will be pro-housing with Sen. John Sparkman as chairman of the housing subcommittee.

Atomic Energy Committee chairmanship switches from Sen. Clinton Anderson of New Mexico to Rep. Carl Durham of North Carolina—and Durham is expected to be closer to the Administration than Anderson, who is sparking the Democratic drive for bigger federal construction of atomic power plants.

But note that the Republicans could take charge in the Senate if one seat shifts from Democrat to G.O.P. The margin there is that narrow.

•

First enforcement action under the new federal water pollution control act will come at Homer, La. A panel of federal and state officials will hold a hearing Jan. 16 in the case charging 18 oil wells with fouling the water of the Corney Creek drainage system which flows from Arkansas into Louisiana's Corney Lake. Conduct of the case will give an indication of the pattern enforcement officials expect to follow under the law.

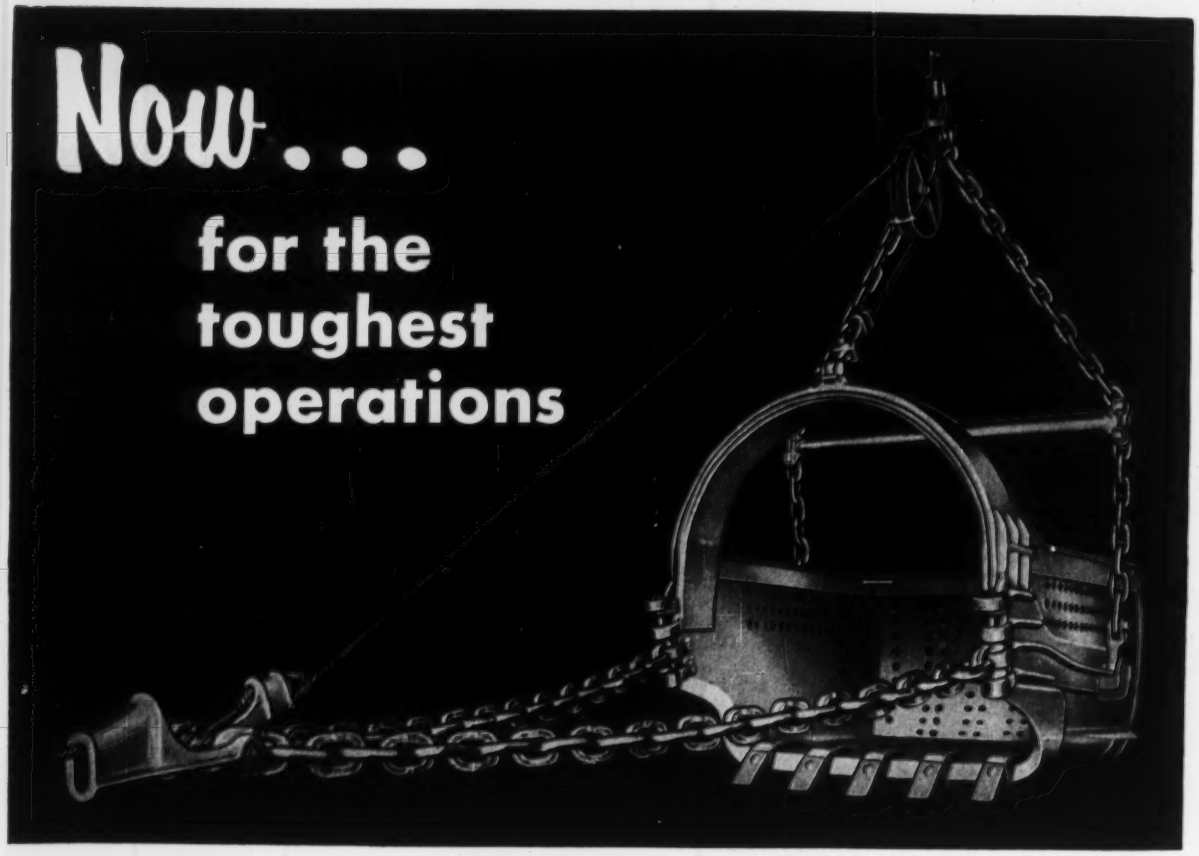
Should the panel find against the alleged polluters there are still several steps that have to be taken before the offenders could be brought into court. A judge, by law, has to consider the practicality and economic feasibility of securing abatement—including ability to pay.

•

Controversy over proposed construction of $310-million John Day Dam on the Columbia River is coming up again as part of the Administration's problem of what to do about its partnership policy. Back in 1950 it was authorized as a federal project—but Eisenhower a year ago backed a partnership proposal which would have permitted private companies to have the power by putting up $273 million for the power part of the project.

The legislation to accomplish this did not get far in Congress and the election results that bolstered Democratic opposition to partnership have put the John Day situation in a new light.

The question now is whether the Administration changes its position to favor an all-federal project including federal marketing of the power by the Bonneville Power Administration.



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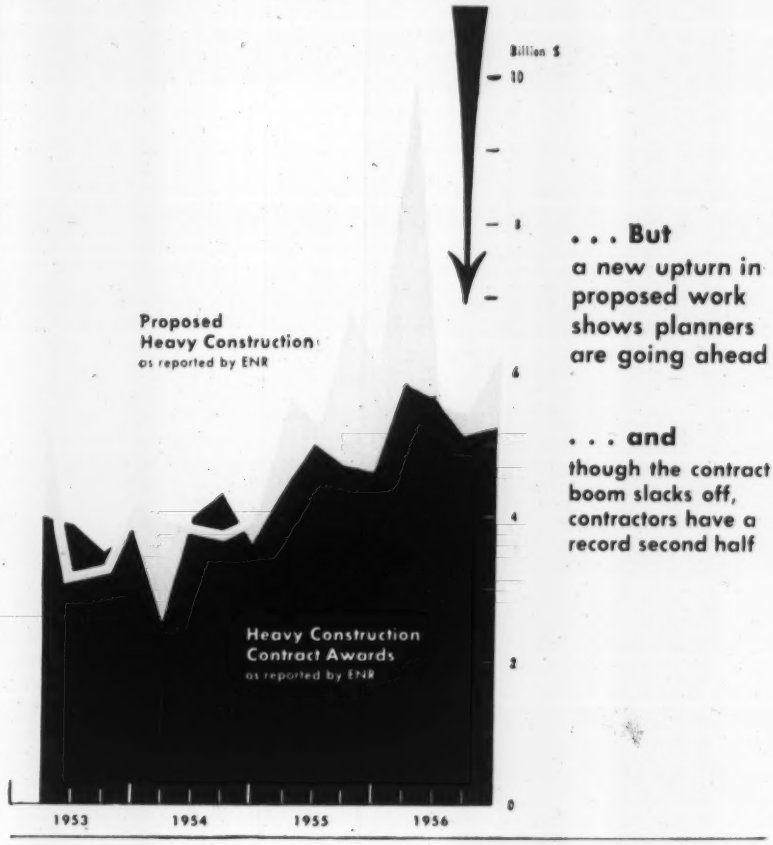
Tight Money Lowers the Boom . . .



. . . But a new upturn in proposed work shows planners are going ahead

. . . and though the contract boom slacks off, contractors have a record second half

So . . .

The Boom Stretches Into 1957

Despite a tight money market and a month-long steel strike, heavy construction contractors signed up more new business in 1956 than in any previous year on record.

Awards reported by ENGINEERING NEWS-RECORD and CONSTRUCTION DAILY, in 1956 totaled $21.7 billion, 16% over the previous high, set in 1955.

In the private construction field, industrial and commercial building both set new records. New dollar highs for public works were posted by sewerage construction, waterworks, earthwork, irragation and drainage, and highways.

Industrial building was the show-stopper on the 1956 construction scene. Contracts for this type of work totaled more than $5.3 billion, a whopping 81% above 1955 and 29% more than the previous high in dollar volume, set in 1951 during the forced-draft expansion of the Korean war.

Commercial building jumped 24%. It reached a total of nearly $2.1 billion and set its fifth consecutive annual record in the process.

In the public works field, sewerage construction rocketed 44% over the previous year's total, climbing to $579 million. Waterworks awards were up 13% to $356 million. Earthwork, irrigation and drainage contracts soared 34% to reach $730 million.

A 16% gain brought highway contracts to a new record of almost $2.5 billion while bridge awards scored a 14% gain, to reach $622 million. It was the second best year on record for bridge awards.

Substantial gains also were reported for public buildings other than housing, up 21% to $2.1 billion, and public housing, up 29% to $318 million. However, both fell far short of previous record highs.

Private mass housing was the only major type of construction that failed to make a gain in 1956. Government-pegged interest rates on mortgages insured by the Federal Housing Administration and the Veterans Administration were too low to compete with other segments of the money market.

Because of this, and some other factors, mass housing contract awards slumped 14% from the 1955 total. However, this was still the second highest annual dollar volume on record.

Higher prices and a shift toward larger houses held the dollar volume decline to 14%, even though housing starts, reported by the Bureau of Labor Statistics, were down 17%.

• **Costs rise sharply**—The unprecedented demand for new construction set the stage for a sharp rise in costs. The ENGINEERING NEWS-RECORD 20-cities cost indexes rose more than 4% during the year.

The ENR Construction Cost Index climbed 4.7%; the Building Cost Index was up 4.3%.

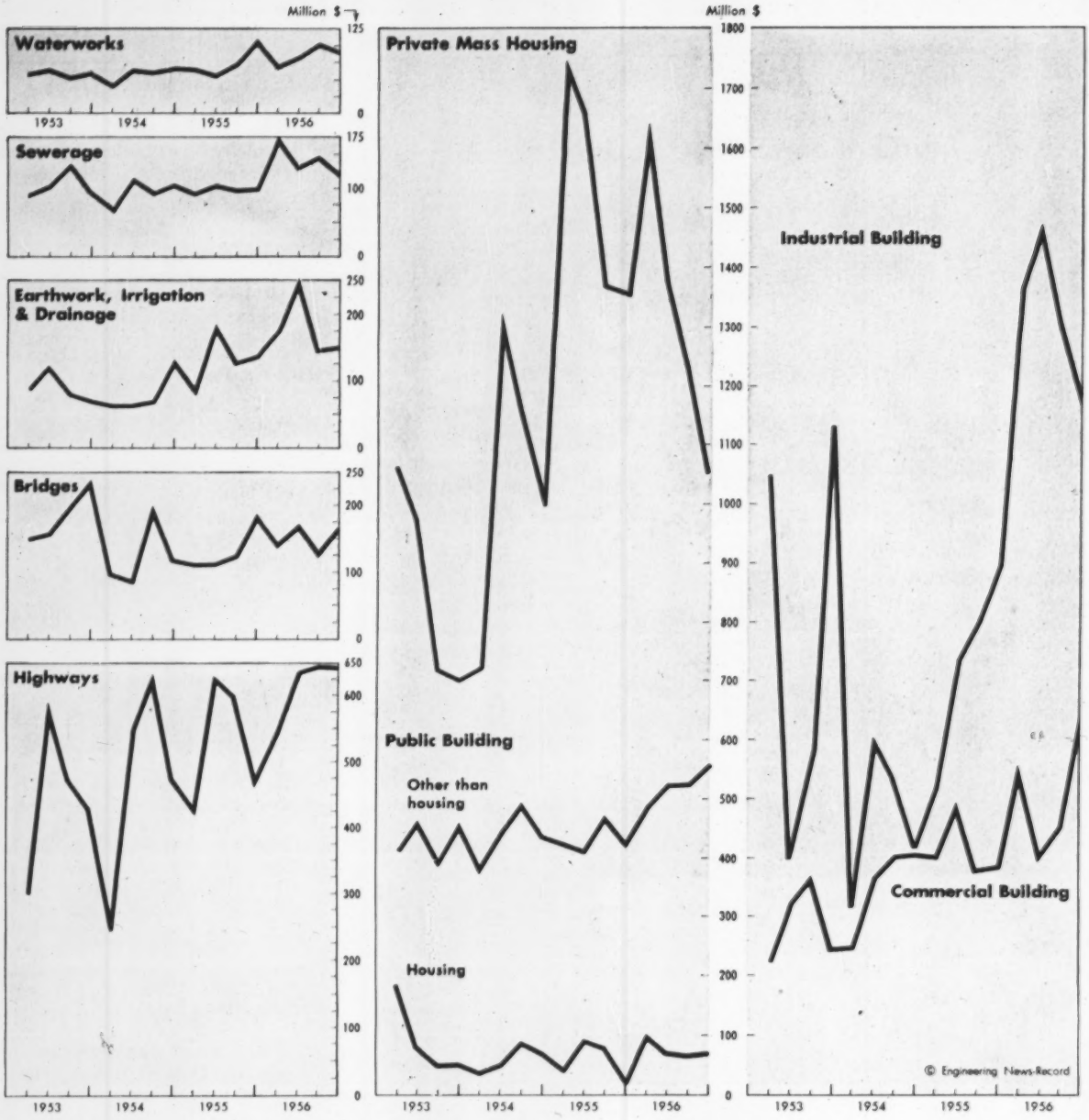
Contributing to the cost rise were increases of 8.7% in the mill price of structural steel, 6.4% in bulk portland cement, 4.5% in common labor rates, 4.6% in bricklayers' rates, 4.3% in carpenters' rates and 4.1% in structural ironworkers' rates. These wage increases are based on a 20-city averages, including hourly base rates and fringe benefits.

Lumber prices represented the only soft spot in the cost picture. Douglas fir lumber and plywood prices skidded as the housing slump deepened and even though the new minimum wage law brought a temporary increase in prices for southern pine lumber, much of this increase had disappeared by the end of the year.

• **Contractors raise prices**—To improve slim profit margins, contractors raised their prices enough to more than offset the increased cost for materials, manpower, machinery and money.

Building contractors' selling prices rose about 7% on the average, according to price indexes reported by five contractor firms.

Morever, highway bid prices increased 8.6% on federal-aid highway projects, according to the Bureau of



Public Roads Composite Mile Index. At the same time, bid price indexes of 10 state highway departments showed increases ranging from 10% to 35%.

Bid prices on heavy engineering projects such as dams, hydroelectric power projects and tunnels rose about 9% in 1956.

• **Money squeeze stretches boom**—During 1956, the record demand for capital to finance new construction pushed interest rates to the highest levels since the late 1930s. While this had little effect on industrial building, it did cause some municipal public works construction to be deferred.

In many cases, states and municipalities were unable to compete with industry for investors' funds because of statutory limitations on the interest rate that the public bodies could pay.

Some commercial construction also was deferred because of the tighter money market. But, the effects of the 1956 tight money policies were most significant in the private masshousing field.

Private housing starts dropped to 1.1 million for the year. This was about the same level of housing activity reported in 1952 and 1953, just prior to the easy-credit housing boom of 1954-55.

• **Outlook for 1957**—Heavy construction contracts in 1957 will top the 1956 dollar total by about 10% according to ENR-CD forecasts.

This increase is expected even though some would-be borrowers probably will go begging for money most of the year. The anti-inflation policy will not kill the boom. Instead, the tight credit reins in the hands of the Federal Reserve Board and the Administration probably will continue to stretch out the boom.

The volume of construction will continue to rise but the rate of growth will be slower than the rise in demonstrated needs, as shown by the ENR-

CD backlog of proposed heavy construction.

This backlog now totals $105 billion. It rose at an unprecedented rate in 1956. At a time when contract volume was climbing 16%, the backlog went up 14%.

Construction costs are expected to rise again in 1957, and, as a result, contractors' selling prices will be up.

While the ENGINEERING NEWS-RECORD Cost Indexes are expected to rise about 3.5% in 1957, this will be at a slower pace than the cost rise in 1956.

Construction costs are sure to rise as a result of a new round of freight rate increases granted to railroads by the Interstate Commerce Commission. Already in effect are a 7% hike by eastern lines, and a 5% increase by the western roads. Southern railroads are sure to get a similar increase after hearings on January 7. Lumber products were held down to a 6 cents a hundred pounds increase in rates, and millwork to 7 cents a hundred pounds.

On top of this is a pending request by the eastern and western lines for an additional 15% boost. Final action on this however won't come for several months, with the southern lines expected to be brought in on any final rate increase granted. Guessing is that the railroads will get part of the big increase, but not all of it. Shippers didn't oppose the opening round of increases too much, but are girding for a battle over the proposed 15% hike.

But, it is not only railroad freight increases that are shaping up. Traditionally they set the pace, then truckers and inland waterway carriers slap on similar increases. Motor freight bureaus around the country are already talking of installing 10 to 15% rate increases, but conditioned on the ultimate increases granted to the rails. Unlike railroads, truckers can install higher freight increases without getting prior approval by the Interstate Commerce Commission. They only have to justify them if the new rates are challenged by other carriers or shippers. Then, the ICC decides if they can go into effect.

It all means that builders can get set to pay more for construction materials. The ICC set the pattern in the recent round of hikes granted to the railroads when it overrode requests by the industry for lower increases for hauling aggregates, cement, roof granules, and other building materials. It leaves little hope for special treatment to builders on subsequent freight increases that are granted.

San Francisco Bay cities are on threshold of . . .

Winning the Pollution Battle

The largest remaining hurdle, and one of the last, in a two-decade campaign to end raw sewage discharge in San Francisco Bay waters has been cleared. Last month voters of Richmond, biggest city still dumping raw sewage, approved an $8-million bond issue for interceptors and a primary treatment plant.

The Richmond vote and recent activation of a 34-mgd treatment plant in San Jose cap a 20-year effort that has borne upwards of $100 million worth of highly gratifying though not always perfect results. Both Richmond and San Jose have populations exceeding 100,000. Now the largest Bay Area city without any sewage treatment works program is Benicia, with a population of only 10,000.

• **Push begins**—The campaign to end raw sewage discharge into San Francisco Bay waters was initiated in 1936 when the California Department of Public Health brought to the attention of East Bay cities the seriousness of the pollution situation. A resulting committee of city engineers brought about establishment of a special district of the East Bay Municipal Utility District for sewage works construction and operation. Finally, in 1946 a $23.5-million bond issue was pushed through. Sewage works have been in operation for several years but not all East Bay sewers are yet connected into the system.

In 1946 the State Department of Public Health went on record as opposing raw sewage discharge into state waters. Health authorities were even more explicit in the case of San Francisco as they informed city officials that they might take legal action to prevent raw sewage discharge if San Francisco did not undertake a treatment program. This resulted in a $15-million bond issue passed by San Francisco voters in June 1948. San Francisco now has a system of treatment plants and interceptors, although here again not all areas in the city are presently connected to the system, but progress is being made.

• **Revise control setup**—In 1950 responsibility for pollution control in the Bay Area, as in all other areas, passed from the Department of Public Health to a regional water pollution control board. Since then some $90 million of sewage works have been either constructed or financed in the Bay Area.

Biggest problem according to John Harrison, executive officer of the Bay Area Regional Water Pollution Control Board, is lack of coordination in unincorporated areas and lack of cooperation between adjacent municipalities. Harrison cites one small watershed where there are seven separate treatment plants, an outgrowth of residential development in seven different subdivisions. These treatment plants are operated on a part-time basis. Had the area been able to construct one plant, better operation would undoubtedly have resulted.

Another example are the treatment plants for the cities of Mountain View and Los Altos which are located within 200 ft of each other. Harrison feels that the county governments should do more to coordinate treatment works—including better long-range planning.

He cites Contra Costa County as a good example of coordination. Here, industries are actually bigger than the surrounding towns and industrial sewage treatment is good. The county also has sanitary districts covering large areas. The Central Contra Costa County Sanitary District is currently spending an $8.9-million bond issue program for expansion of its sewage works.

Navy installations on the bay are making progress in pollution control. The San Francisco Naval Shipyard has a $1.5-million program under way that would discharge into the San Francisco city system. At Mare Island Naval Shipyard a $6-million treatment program is in process.

California Maps Extensive Building Starts for 1957

California's State Division of Architecture expects to start construction on nearly $112 million worth of state building projects this year.

About $68 million is earmarked for projects in the southern part of the state. Included are: a $9-million state office building at Los Angeles; a $6-million youth training school at Chino; and a $5-million office building in addition in Los Angeles for the State Highway Division.

A $4.1-million expansion is planned at Patton State Hospital in Los Angeles County, and $2.3 million is slated to go for similar work at Fairview State Hospital in Costa Mesa.

Eight projects in the $1-million class are scheduled for Los Angeles State College. A $2.6-million science building addition and $1.5-million library addition will be built at Long Beach State College.

For northern California, major projects include a $6.8-million office building in San Francisco; $3.3-million office building in Oakland and a $3-million office building in Fresno.

Boost on Inter-American Highway takes effect . .

The End of the Road Is Near

The accelerated program begun in 1955 to complete the Inter-American Highway, which will extend 1,590 miles from the Texas border to Panama City, has now brought the 15-year-old project within sight of completion. U. S. officials in the Bureau of Public Roads working on the program now estimate that the entire all-weather highway will be completed within about two years—although not all sections will be paved by then.

This week the Export-Import Bank moved to plug another gap in the highway with a $2-million loan to Nicaragua to complete its section from Honduras to the Costa Rican border. Last contracts for the final 107-mile stretch in Nicaragua will be signed within the next couple of weeks, and the job is scheduled to be completed in about 18 months. Nicaragua already has built 155 miles of its segment of the highway from Sabaco, 65 miles northeast of Managua, to Rivas, 70 miles southeast of Managua, with the help of an earlier $2-million loan from Ex-Im made in 1941.

The status of the highway in other countries:

• **Mexico**—All-weather highway completed from border to border, much of it paved.

• **Guatemala**—All contracts have been let as of now. The difficult 25-mile stretch near the Mexican border, which has been delaying operations, is slated to be opened next July. The remaining sections are expected to be finished by July 1958.

• **Salvador**—Completed and paved from border to border.

• **Honduras**—About half of the total job now is under contract and the remaining part is slated to be contracted for within the next six months. Border-to-border all-weather highway is expected to be finished in about two years.

• **Costa Rica**—The entire stretch is under contract except for 20 miles in the south, which is expected to be contracted for within the next couple of months. The job should be finished within 18 months to two years.

• **Panama**—All contracts have been let and work is slated to be completed in about two years.

• **How it's done**—The Inter-American Highway is being built under arrangements with the governments concerned, whereby the U. S. grants funds for two-thirds of the total cost and the other governments finance the remaining one-third.

To date, Congress has authorized roughly $128 million worth of grant aid for the project, not all of which has been appropriated. In addition, the War Department put an unspecified amount into the highway during World War II. The Export-Import Bank has loaned a total of $13.5 million to participating governments to help them finance their share of the cost. In addition to the $4 million loaned to Nicaragua, Ex-Im loaned $9.5 million to Costa Rica in 1955 for the highway.

Planning fo the vast international highway system began in the late thirties. Active construction got under way in 1940. Work was pushed hard by the War Department in the early years of World War II for strategic reasons, but construction slowed to a crawl when it became apparent it would be impossible to complete the job in time for it to have any military utility. The U. S. revived the policy of extending financial assistance in 1950, and the pace of construction then picked up.

In 1955, President Eisenhower launched a crash program to finish the job quickly. Congress authorized grants of nearly $75 million, of which $62 million was appropriated. As of last June about $30 million worth of contracts had been let under the accelerated program.

The Administration will have to go back to Congress for more funds to complete the project. Officials estimated in 1955 that the U. S. share would come to around $75 million. Since then, construction costs have risen sharply and the figure now probably will be closer to $100 million, of which only $62 million actually has been appropriated.

More than a dozen U. S. construction companies have worked on the highway since the accelerated program started, with the contracts fairly evenly divided among them.

Arizona Has Trouble With Towns, "Grand Plan" Shaky

Caught in a web of public pressure against bypassing small communities, Arizona may be forced to reject the whole multi-million-dollar U.S. road program rather than go along with immediate bypass plans.

William E. Willey, State Highway Engineer, told B. M. French, District U.S. Public Roads Engineer, that Arizona wants to bypass bypasses for the time and concentrate on noncontroversial projects in the wide open spaces.

"With the local-citizen pressure building up in Arizona against bypasses," Willey noted, "it would be nothing less than foolhardy to try and resolve many of these controversial urban situations at this time.

"Any idea along this line could only result in confusion and the probably ultimate defeat of the entire program by Arizona legislative action."

This threat is actual. Sen. A. R. Spikes of Cochise County, longtime legislative leader, has promised such action if the Apache Pass bypass project is carried out. This project would route the new road around such Southern Arizona towns as San Simon, Bowie, Willcox, and Benson.

Taking Stock

Highway departments gear up for the big job ahead

In an attempt to streamline its operations, principally to take best advantage of the new federal highway program, the Pennsylvania Department of Highways announced a reorganization of its top-echelon level last week.

Principal features of the reorganization include the addition of two new deputy secretary posts (previously only one deputy secretary was authorized) to subdivide administrative duties that now center on the office of the state Secretary of Highways. Under the new setup, George J. Richards, incumbent deputy, will be responsible for administrative functions, budget, fiscal matters, legislation and personnel. Richard J. Harris will have charge of an eastern division and Harold F. Gerold will head a western division.

General engineering for the department will remain under the leadership of Robert A. Farley, acting chief engineer, who will have the new title of Deputy for Engineering. In his particular charge will be project development, field operations, research and testing.

• **North Carolina details**—Meanwhile, North Carolina, which a few weeks ago announced sweeping changes in its Highway Department organization (ENR Dec. 20, 1956, p. 23) got "hearty approval" of the program from Gov. Luther Hodges and planned to submit the new organization for approval of the state legislature in February.

In addition to administrative changes previously announced, the department's report to the governor recommended reduction of the present 15-member Highway and Public Works Commission to seven members; the appointment of a highway director who would be, in fact, the chief administrative officer of the department, instead of the chairman. The chairman would function exclusively at meetings of the commission and would have little say in departmental affairs.

"Lift-Slab" Suit

Court rules name describes method, is in public domain

The term "lift slab" is not proprietary, according to a California court decision that was handed down last month.

The words merely describe a construction method, ruled Los Angeles Superior Court Judge William J. Palmer, and were correctly used for that purpose by Western Concrete Structures Co., Inc., of Los Angeles, defendant in a suit brought last summer (ENR June 21, 1956, p. 27) by the United States Lift Slab Corp. of Austin, Tex., and its licensee, the Vagtborg Lift Slab Corp. of Los Angeles.

The plaintiffs had accused WCSCo of violation of confidential disclosure, trade-mark infringement and conspiracy in unfair competition.

WCSCo, the plaintiffs charged, had used trade secrets and equipment designs acquired in confidence from the lift-slab firms during the course of unsuccessful talks held for the purpose of starting a joint venture to combine lift-slab and prestressing techniques.

The plaintiffs also maintained that the term "lift slab" had become identified with their product and that their reputation and business had suffered because of the defendant's activities.

Judge Palmer stated in his decision that "lift slab" is simply a descriptive term, with no trade mark, service mark or trade name significance. He ruled further that the evidence showed convincingly that the alleged confidential relationship between plaintiff and defendant did not exist and that the defendant's activities were neither intended to deceive nor likely to deceive prospective customers.

The judge also ruled against a cross complain in which WCSCo had alleged damages and unfair competition. He awarded court costs to WCSCo, however.

A second suit against WCSCo, involving patents of United States Lift Slab Corp., still is pending in federal court.

Underwater Erosion Blamed for Cave-in of Parking Lot

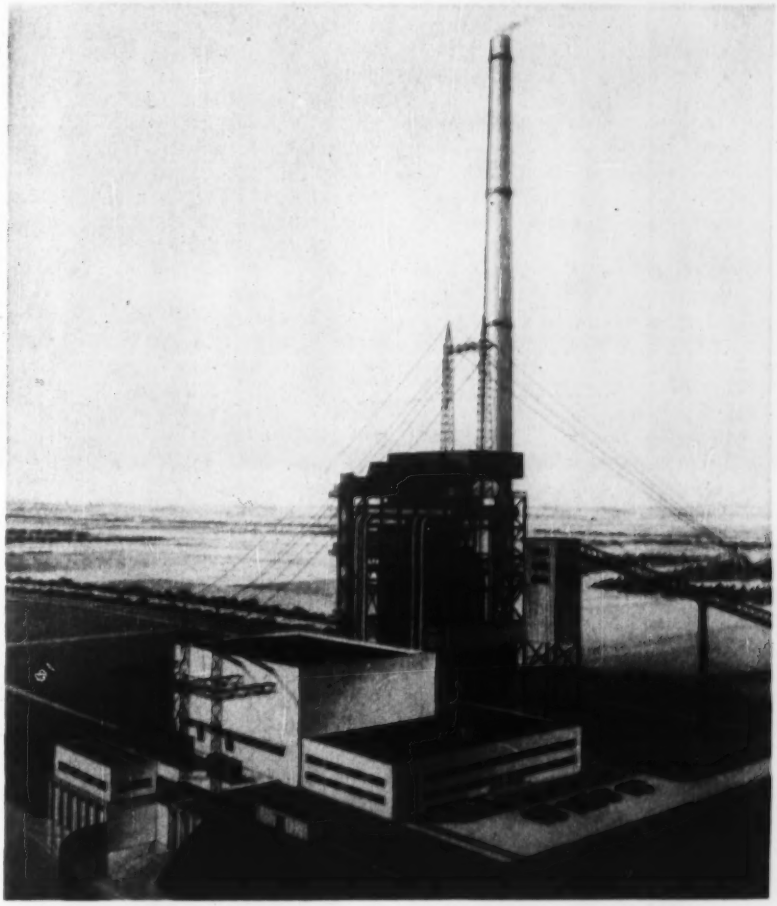
Underwater erosion has been tagged the cause of cave-in last month of part of a new $4-million waterfront parking facility in Jacksonville, Fla.

Reynolds, Smith & Hills, Jacksonville engineers who designed the project and made the damage investigation, found that tides and currents in the St. Johns River had scoured the river bed along the bulkhead and gouged out caverns beneath the parking area. A 75x25-ft undermined section of sand fill sank, opening a cavity large enough to allow a diver to descend.

The city-owned project covers an area four blocks long and two blocks wide. It consists mainly of sand fill from the river bottom. The bulkhead along the river front and both returns is steel sheet piling, driven to 35 ft.

To repair the damage already done will cost an estimated $55,000, according to George B. Hills, of the engineering firm. He suggested placing granite riprap along the water side for 500 ft and along one of the return bulkheads for 100 ft. There is no assurance that more cavities won't develop later.

Hills said that his firm had been aware of the possibility that shifting currents might scour the river bed at the bulkhead line, but precautionary measures would have added $1 million to the cost of the project. The protective work would have meant driving the piles 10 ft deeper and placing riprap along the full length of the bulkhead. The extra 10 ft of depth would have carried the piling through the rock layer on which it now rests and into a blue marl formation below.



Bigger Turbine Takes Less Space Per Kw

It will take 38% less space to house one of American Gas & Electric Company's record-setting 450,000-kw units than would be required for two units half that size. The planned building will include 5,350,000 cu ft of space, as opposed to the 8,666,000 cu ft that would be required for two 225,000-kw units.

This $58-million Breed Plant of AG&E's subsidiary Indiana & Michigan Electric Co. is now but an excavation job started in November along the Wabash River below Terre Haute. AG&E has a second 450,000-kw unit being manufactured for its Philip Sporn Plant on the Ohio River near Graham, W. Va.

Economy of the giant-size units is largely to be gained through increased operating efficiencies, but the building space saving per kilowatt of capacity is a considerable item.

The plant's turbine room will be 128x148 ft and 72 ft high. Boilers will be outdoor-type construction, standing about 23 stories high alongside the plant's single 577-ft stack.

More Water

Oklahoma City starts on five reservoir projects

Oklahoma City is now buying up land 130 miles southeast of the city for the first two of five planned water supply reservoirs. Initial phases of the program will be financed through a $13-million water bond issue voted in December 1955.

Unanimously adopting a report by Oklahoma City consulting engineer C. E. Bretz, the City Council is moving for immediate construction of a dam on North Boggy Creek, 3½ miles north of Atoka, Okla. This first dam will be 600 ft long and will impound 125,000 acre-ft of water. A state highway will have to be relocated to build the dam. Three bridges are to be replaced with one long bridge, the roadway is to be raised 3,000 ft, and a 66,000-v transmission line must be moved.

Bids will soon be let for clearing the site, constructing the dam and spillway and relocating the highway, according to Morrison B. Cunningham, city public works director. Completion date for Atoka is set for early 1958.

The second dam, being delayed until oil potential in the area is determined, will go up on nearby McGee Creek.

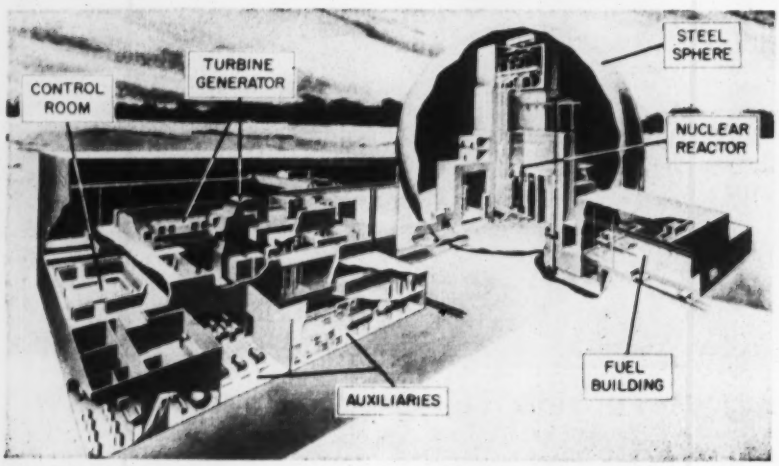
Land for the two lakes, right-of-way for a pipeline, sites for a filtration plant and balancing reservoir, and building the Atoka Dam, will come under the December bond issue. A later bond issue will pay for the pipeline and filtration plant.

The McGee and North Boggy sites will be the closest of the five locations to Oklahoma City.

Tight Race Against Demand Seen for Northwest Power

If all hydro projects now under consideration are in full operation by 1967, the then anticipated 12.5 million kw firm load in the Pacific Northwest can be met—but only if water conditions are normal or better. This was the forecast of Marshall Blair, operations engineer for Washington Water Power Co., Spokane, made recently at the Pacific Northwest Utilities Conference.

Blair warned that if 1967 is a low-water year, the region may be as much as 2 million kw short of firm load demand. Among the projects that must be started soon are John Day on the Columbia River (1.1 million kw installed); Wells Dam on the Columbia (390,000 kw); Mountain Sheep and Pleasant Valley Dams on the Snake River (1 million kw); and Seattle City Light's Boundary Dam on the Pend Oreille River (570,000 kw).



A-Plant Due for Construction in Spring

A 190-ft sphere will enclose the boiling water reactor of Dresden Nuclear Power Station, $45-million project of Commonwealth Edison Co. and Nuclear Power Group, Inc. Construction will start this spring on a site 50 miles southwest of Chicago.

The 180,000-kw plant is due for completion in mid-1960. Major components will be above ground.

Commonwealth Edison, paying $30 million of the cost, will own and operate the plant. The Nuclear Power Group, Inc., paying $15 million as a research investment, includes American Gas & Electric Service Corp., Bechtel Corp., Central Illinois Light Co., Illinois Power Co., Kansas City Power & Light Co., Pacific Gas & Electric Co., and Union Electric Co.

Code Changes

N. C. Legislature will be asked to untangle laws

In a move to untangle North Carolina's "maze of building laws and regulations," a Commission on Reorganization of State Government will recommend to the 1957 legislature, convening in February, that:

- The statutory basis of the state building code be rewritten.
- The building-code council be enlarged to include more technical and public representatives.
- Occupational licensing boards be supervised more closely.

The commission said that six state agencies now promulgate various types of building regulations, four pass on private construction plans, eight pass on plans for public buildings, and six agencies are authorized to make periodic safety or health inspections. The result, the commission said, is a hodge-podge.

The first part of the commission's proposed remedy is to increase membership on the building-code council from five to nine members. New members would be a mechanical engineer, an electrical engineer, a municipal building inspector, the assistant director of the budget and a representative of the public at large. The latter three would replace the organized-labor representative now on the council.

The broadened council would then be assigned primary responsibility for recommending changes in building laws and enforcement practices. It would have the authority to approve local codes, which would thereafter supersede the state code. It would be empowered to amend the state code, subject to certain legislative restrictions. In short the council would become the focal agency for state regulation of building construction.

The commission noted also that existing laws offer no protection against certain possible abuses by occupational licensing boards.

Although existing licenses cannot be suspended without cause and qualified applicants cannot be barred from taking examinations, the commission pointed out that nothing in the existing statutes prevents a board from denying a license or making the qualifying examination overly difficult, in order to protect those already practicing a profession or trade.

The council will recommend that all licensing boards be required to report annually to the Secretary of State the number of applicants who were refused examinations, those who failed exams, the number of revocations and suspensions, and a similar breakdown on each type of action taken.

Puget Sound Power

Additional 1.9-million kw to be provided by projects

Four of the five members of the Puget Sound Utilities Council plan to spend $100 million a year for the next eight years to provide an additional 1.9-million kw for the area.

Seattle City Light is building a high dam at Gorge on the Skagit River to produce an additional 57,000 kw, and proposes to build the 570,000-kw Boundary project on the Pend Oreille River.

Tacoma City Light has preliminary work under way on the 160,000-kw Mayfield Dam and later will build the 300,000-kw Mossyrock Dam, both on the Cowlitz River, provided that legal difficulties are solved.

Puget Sound Power & Light Co. is building an 85,000-kw project on the Upper Baker River, will increase the capacity of its Lower Baker plant by 55,000 kw and of its Snoqualmie River plant by 20,000.

Chelan County PUD has initial work under way on the 630,000-kw Rocky Reach Dam on the Columbia River, but still has to settle a high fastwater problem upstream at Douglas County PUD's wells site to complete financing.

Only Snohomish County PUD has no generating projects scheduled, although it has several studies under way.

If all hydro projects planned and under construction for the region progress on schedule, customers of the five utilities can be assured of ample power through 1967-68 from hydroelectric resources, according to Dean Barline, Tacoma utilities director and Council chairman.

Study Group Asks State To Unravel Water Agencies

Clearer areas of responsibility are needed to combat the "state of confusion" obscuring North Carolina's future state role in water resources, according to the state's Commission on Reorganization of State Government.

To accomplish this, the commission set up by the 1955 session of the legislature recommends curtailing the duties of the Board of Water Commissioners and clarifying the responsibilities of the State Stream Sanitation Committee and the State Board of Health.

The commission's report, to be submitted to the February session of the legislature, lists among its remedies:

1. That the Board of Water Commissioners—created by the 1955 legislature—function mainly as an advisory group on future water resources issues.

2. That the Department of Conservation and Development turn over to the water commissioners its responsibilities for planning and making recommendations on water policy.

3. That the water commissioners return responsibility for water research and informational activities to the Conservation and Development Department.

4. That the State Stream Sanitation Committee continue as an independent unit of the State Board of Health, with the board designated the administrative agent of the committee.

The commission also holds in its report—which has already been submitted to Gov. Luther H. Hodges—that before the state's future role in water resources can be determined, "additional factual data must be gathered; a sound and practical water program must be prepared; and the public must be informed of the problem and of alternative courses of action."

An Answer—Maybe

Plan of metropolitan council would ease works financing

The 1957 Washington State Legislature will authorize establishment of metropolitan councils with fund-raising powers, if it accepts the recommendations of a Metropolitan Problems Advisory Committee appointed by Mayor Gordon S. Clinton of Seattle.

Three major problems in the Seattle area can be solved only on a metropolitan basis, said the committee. These are sewage pollution, mass transportation and air pollution.

In the matter of sewage pollution, the committee found there "is a clear and present danger that Lake Washington will be virtually destroyed as a community recreational asset" because of the discharge of raw sewage into the lake, which forms Seattle's eastern boundary. It believes it is "imperative that a system of major trunk sewers and sewage-treatment plants be constructed, financed and operated by a metropolitan agency, and that all sewage districts, cities and towns draining into Lake Washington be required to discharge their sewage into these metropolitan facilities."

High-speed rail transportation operating on a separate right-of-way was recommended as the ultimate solution to the transit problem. The system would be built by tax money.

As to air pollution, the committee recommended that minimum "regulations and controls be established after study, and enforced on a metropolitan-area basis."

Garbage and refuse disposal, water supply, health regulation, parks and land-use planning were noted as other functions of a metropolitan council.

Who's to Teach?

Two schemes urged to ease engineer-teacher shortage

Draft engineering graduates for a period of science teaching in the nation's high schools; interest women in teaching engineering courses in the colleges.

These proposals for easing the engineer shortage by tackling two of its more critical causes were made within a week by two speakers who were located on each coast of the country—one in New York City, the other in California.

Addressing the annual meeting in New York of the American Association for the Advancement of Science, Earl P. Stevens, president of Arthur D. Little, Inc., proposed last week a scheme for assigning science and engineering graduates just out of college to a stint of high-school teaching. Stevens suggested that such temporary assignment of these new graduates be in lieu of the military service now required of them.

Time spent in teaching technical courses to secondary school students could equal and substitute for the time that these college graduates might otherwise be required to put in as trainees in the armed forces, according to Stevens' idea.

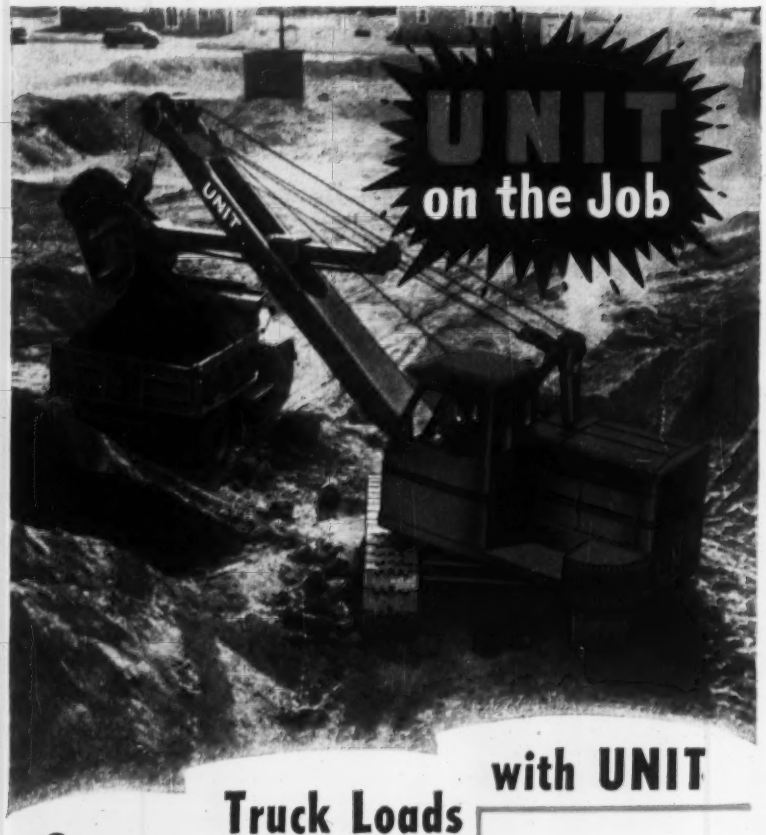
Meanwhile, from the West Coast came a statement from Harold P. Hayes, Dean of Engineering at California State Polytechnic College, in which he cited teaching as a field where women engineers could escape discrimination and find excellent opportunities for establishing careers.

"Probably nowhere else will women engineers find a more 'even-Stephen' career field," said Dean Hayes. He is convinced that the teaching of engineering subjects remains a virtually unexplored field for women.

• **Teaching salaries**—On the problem of attracting teachers to colleges (and holding them there) the National Education Association has released findings on salaries paid in universities, colleges and junior colleges.

A survey of 730 institutions showed that full-time personnel teaching nine months of the year earn a median salary of $5,243. By rank, this is the earning pattern: professors, $7,076; associate professors, $5,731; assistant professors, $4,921; instructors, $4,087.

The study made no attempt to check on earnings of teachers of engineering, specifically; it covered all teachers in schools of higher learning. Also, the study reported only earnings that were derived from teaching for the individuals included.



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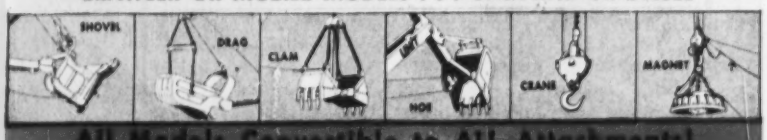

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Better Pipe Design

Concrete Pipe Committee approves new design idea for sewer and culvert pipe

A new design concept for reinforced concrete sewer and culvert pipe for use with five different backfill loadings has been approved, subject to letter ballot, by the Committee on Concrete Pipe (C-13) of the American Society for Testing Materials. When finally issued as tentative specification C76 (replacing present C75 and C76), expected by March, pipe designers will have five classes of pipe to choose from instead of the present two. Also, three of the new classes have complete requirements for pipe up to 108 in. in dia and higher than ever backfill loads can be accommodated by the fifth class.

The new concept is known as the "D-load" method. So-called D-load Ultimate is the load per lin ft of pipe *per lin ft of diameter* to produce failure of a test specimen. D-load .01-in. crack is a similar load to produce the .01-in. crack. Thus, the new 3-edge bearing loads vary directly as the diameter and, for a given class, the ultimate and crack loads are in the same ratio throughout all pipe sizes.

Specified D-loads in lb for the five classes of pipe are as follows:

Class	.01 In. Crack	Ultimate
1	800	1,200
2	1,000	1,500
3	1,350	2,000
4	2,000	3,000
5	3,000	3,750

Comparison with present specifications shows the new Classes 1 and 2 roughly equivalent to reinforced sewer pipe, Class 3 to standard-strength culvert pipe, Class 4 to extra-strength culvert pipe and Class 5 offering new high loadings. Classes 1, 2, and 3 detail shell thicknesses and steel for diameters up to 108 in., Class 4 up to 84 in. and Class 5 up to 72 in.

The new specification also provides a pipe design that meets Bureau of Public Roads new design criteria for culverts.

In other actions, the Concrete Pipe Committee:

- Authorized preparation of a specification for plain and reinforced perforated concrete pipe.
- Accepted two tables in the specification for non-reinforced sewer pipe (C-14) that amplify requirements for standard and extra-strength pipe.
- Placed P. W. Manson of the University of Minnesota as chairman of a newly authorized subcommittee on concrete drain tile.
- Authorized a special subcommittee to develop requirements for rubber couplings for concrete pipe.

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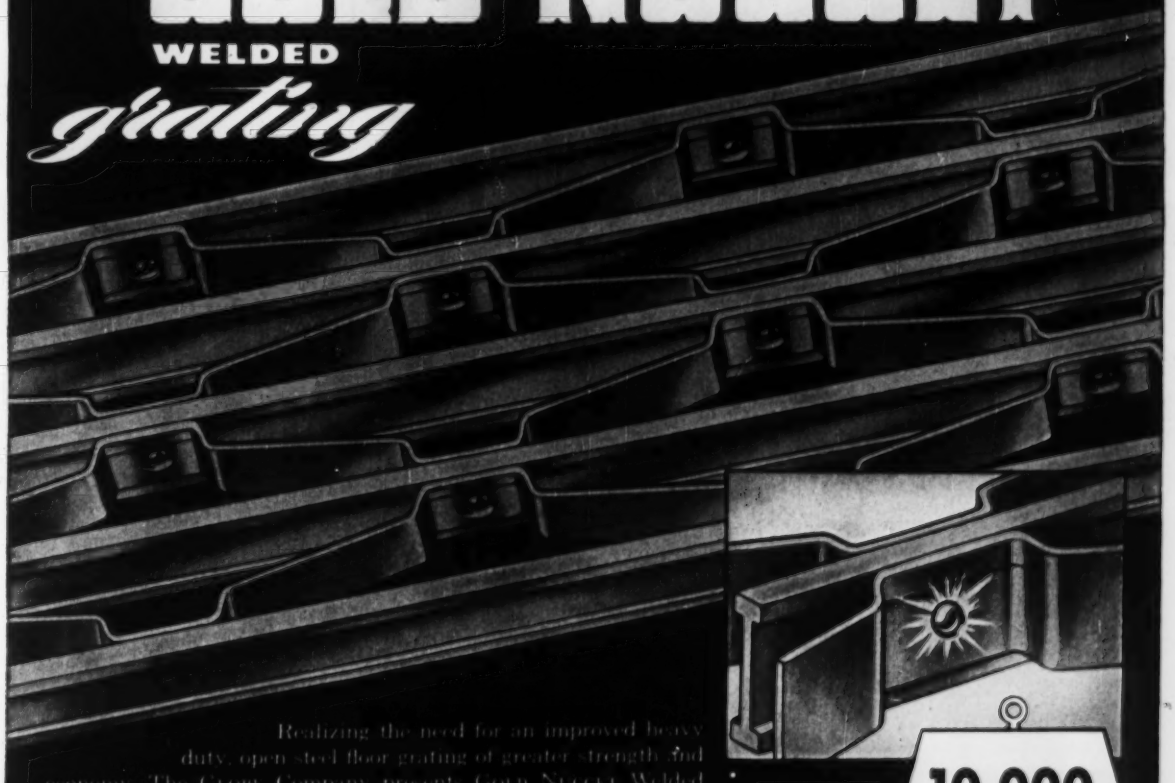

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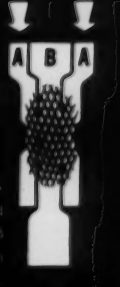

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Peoples Gas Light & Coke Company
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Frederick Gas Company, Inc.
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Gas Department
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Philadelphia Electric Company Gas Dept.
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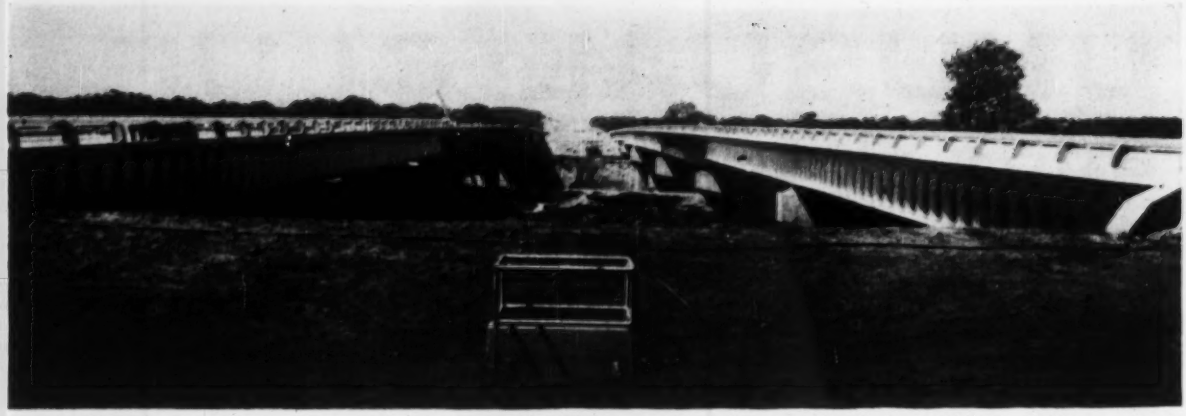


DUAL BRIDGE of continuous girder construction carries the Will Rogers Turnpike over the Verdigris River in Oklahoma. Duplication in other bridges of three-span design used here kept construction costs down.

Making components of bridges on Oklahoma's northeastern turnpike as much alike as possible was a major factor in getting speedy steel deliveries.

THREE EQUAL SPANS take the turnpike over Big Cabin Creek on a skew. Duplication of girders speeded steel deliveries, according to steel fabricators.

Bridges Built Fast on New Turnpike

D. E. Stevens
District Engineer
American Institute of Steel Construction
Oklahoma City, Okla.

Evidence that effective, long-range planning pays off in construction projects is supplied by the impressive progress made on the Will Rogers Turnpike bridges.

All bridges on this Oklahoma project are structural steel. Despite the fact that contracts were let during a period in which the capacity of many steel producers was strained to the utmost, almost all the structural steel was delivered to the job sites by the middle of 1956. Although the turnpike is not scheduled to be opened to traffic until July 1, 1957, steel erection has been completed on most of the turnpike's bridges and many are ready for traffic.

The Will Rogers Turnpike (also known as the Northeastern Turnpike) extends 88.5 miles from the northeast corner of the state to Tulsa. There, a 20-mi, four-lane link is being constructed to connect the new tollroad with the Turner Turnpike, which continues in a southwesterly direction to Oklahoma City, 88 miles away. At the Oklahoma-Missouri line, the Will Rogers Turnpike will connect with a four-lane divided highway being constructed by Missouri.

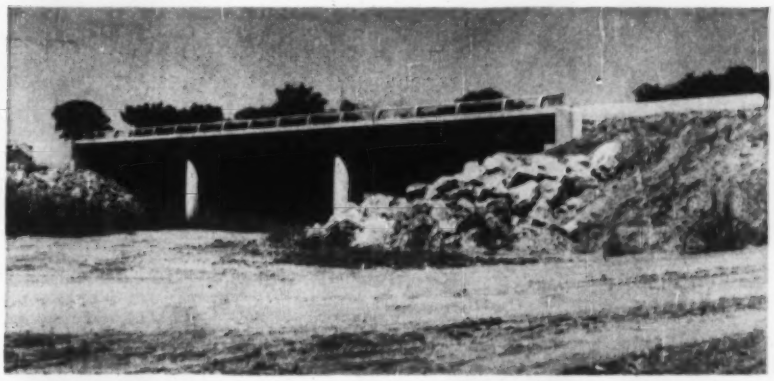
The Will Rogers Turnpike provides two 12-ft wide lanes in each direction, separated by a raised 15-ft-wide grass strip. It also has a 12-ft-wide paved shoulder on both sides. The design is practically identical with that of the Turner Turnpike, except that vertical clearance under grade-separation structures is 16 ft, instead of 15.

• **Prompt steel deliveries**—The speed with which the bridges were built on the new turnpike can be credited to sound planning and prompt steel deliveries. According to the records of one large fabricator, who furnished more than 3,000 tons of the steel used in these bridges, the average time from receipt of order to actual delivery at the job sites has been only 4½ months.

When one considers that there are a total of 90 bridges in the 88.5-mile stretch, including four major stream crossings, and that the total structural steel bridge requirements exceeded 13,000 tons, it becomes apparent that something other than chance was responsible for keeping turnpike progress on schedule. The key is sound planning.

• **Simple design preferred**—As part of this planning, special attention was given to simplicity of design and repetition of details. According to Oklahoma Turnpike Authority engineers,

CONTINUOUS GIRDERS of the Neosho River crossing are flanked on one side by a 65-ft approach span and on the other by nine 80-ft spans. Like the girders, the piers also were designed to be alike, permitting re-use of forms.



TYPICAL SHORT BRIDGE consists of simple, rolled-beam spans designed for composite action with the concrete deck.

steel was chosen for these bridges because it lent itself readily to simplicity of design.

Bridges generally are simple rolled-beam spans. However, for the major stream crossings, long spans dictated the use of continuous, deck, plate girders. Three of the four crossings contain identical girders, thus yielding savings in design, detailing, fabrication and erection time. Deck trusses are used in two bridges.

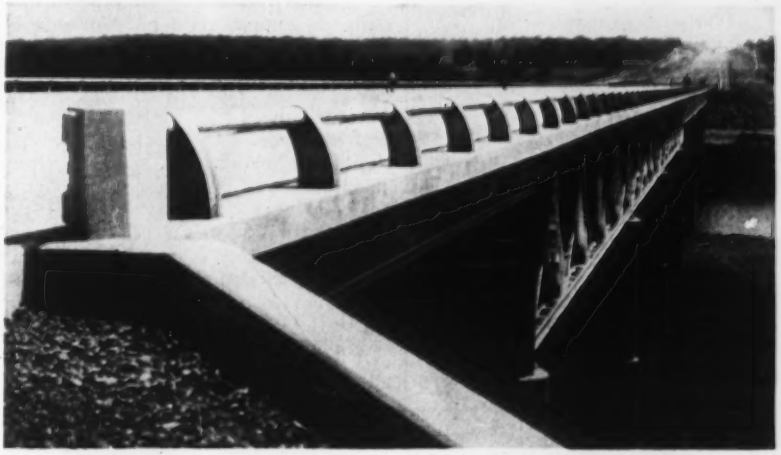
Duplication of design details also was resorted to for the numerous "turnpike under" structures, which usually carry state and county roads. All the bridges carrying county roads over the turnpike—and there are 54—are made up of four simple spans. Although some of the roadways are 18 ft and others 24 ft wide, the same beam size—27 WF 94—is used in all these bridges. All concrete piers and abutments were designed for the maximum possible re-use of forms.

By careful study of approach conditions, and with a minimum of re-arrangement, it was possible to have only two degrees of skew for practically all these structures. Where it was necessary to use a skew, either 20 or 30 deg was used to obtain as much duplication in design as practicable.

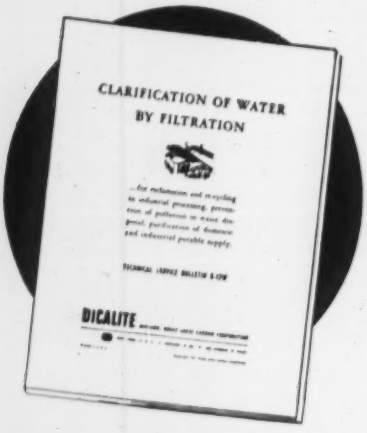
With the exception of the Verdigris River crossing, all bridges carrying the turnpike have the same cross section—two 27-ft roadways separated by a 15-ft median strip and with a 2-ft 10-in. safety curb on both sides. All have the same type of aluminum handrail, and all are designed for H20-S16 loading.

• **Dual bridge**—The Verdigris crossing is the only one composed of two separate structures. This design resulted from the necessity of providing for future use of the river by watercraft. It allows for future raising of the bridge superstructure. When this is necessary, one bridge will be kept open to vehicular traffic while the other is lifted. Foundations of the bridge were sized for the future increased height of piers. These foundations were carried to rock.

The twin bridges are spaced 100 ft c-c. Each has a 30-ft wide roadway with a 2-ft 10-in. safety curb on each side. Average pier height is about 70 ft.



DECK TRUSSES are repeated in three spans of the turnpike's Spring River crossing.



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Oklahoma turnpike bridges . . .

SKEWED BRIDGE carries the turnpike over the K.O. & G. R.R., south of Miami, Okla. Channel shear connectors on girders assure composite action with deck.

Both structures are symmetrical, consisting of two 121-ft continuous approach spans on either side of a 147-210-147-ft continuous center unit. This three-span section, like the approach spans, is supported on four lines of 7½-ft deep, riveted plate girders, which are duplicated in two other major crossings. It is separated from the approach span by expansion joints.

The Neosho River crossing, which also has typical three-span girders, consists, in addition, of nine 80-ft simple spans and another approach span 65 ft long. However, its piers, unlike those of the Verdigris crossing, which are the T-head type, consist of circular vertical shafts with solid web between. They are founded on bedrock, while abutments rest on steel bearing piles.

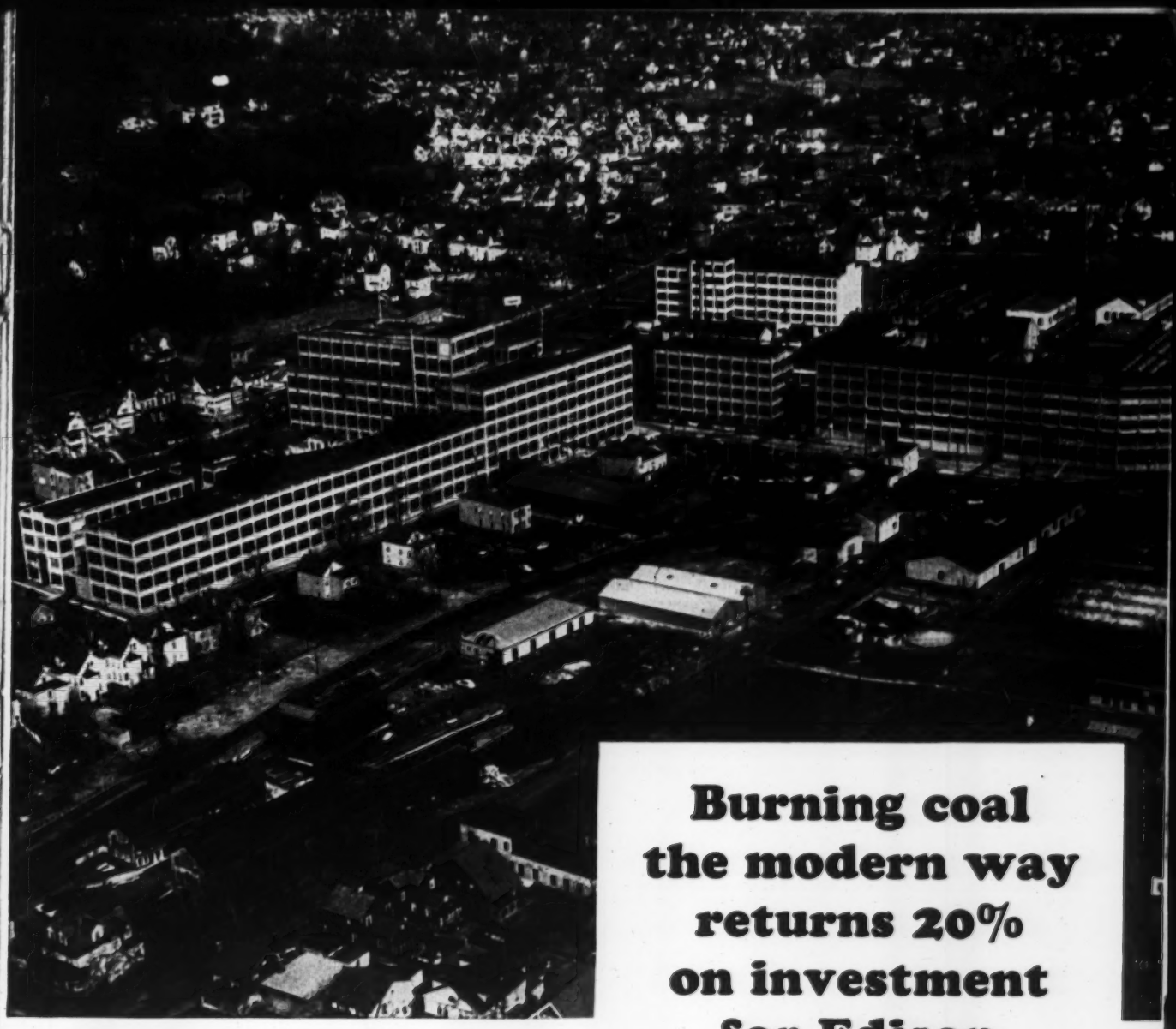
• **Skewed bridge**—The bridge across Big Cabin Creek is on a 30-deg skew, but simplicity of design reduced complications to a minimum. It consists of three 99-ft riveted plate-girder spans. Each span contains four lines of 5½-ft deep girders, made composite with the concrete deck with channel shear connectors.

Solid-web circular-shaft piers also were used for this bridge.

Where vertical clearance was not critical, trusses were found economical only for a relatively short bridge across Five-Mile Creek and the Spring River crossing, where Warren trusses are used for three 100-ft spans. The latter bridge also incorporates typical three-span girders. Its trusses, spaced 25 ft c-c, are 12 ft deep and have laced-channel chords and wide-flange-beam web members. Floorbeams are 18 WF 64 beams spaced 10 ft c-c.

The smaller bridges on the turnpike are simple-span structures, with girders and deck designed for composite action. They are attractive and well built and should give many years of service with a minimum of maintenance.

DeLeuw Cather & Co. are the principal consulting engineers for the turnpike authority. Lee Hendrix, consulting engineer, Tulsa, designed the major stream crossings and railroad, state and federal highway crossings. Other bridges were designed by Geo. G. Toler Engineering Co., Wyatt B. Hendrick, Hudgins Thompson & Ball, and Fell & Wheeler—all Oklahoma consulting firms. W. D. Hoback is chief engineer and manager of the Oklahoma Turnpike Authority and L. S. Rawlings, chief bridge engineer.



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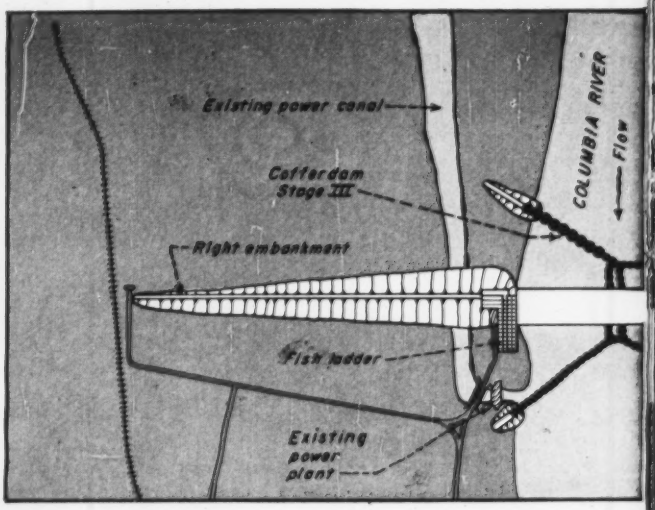
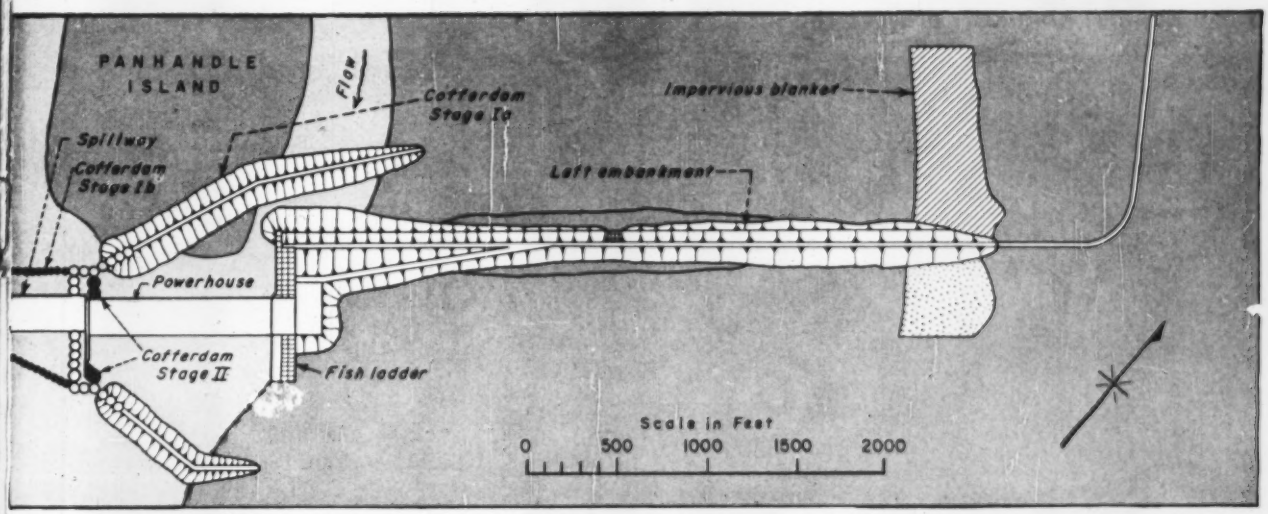
Priest Rapids Dam

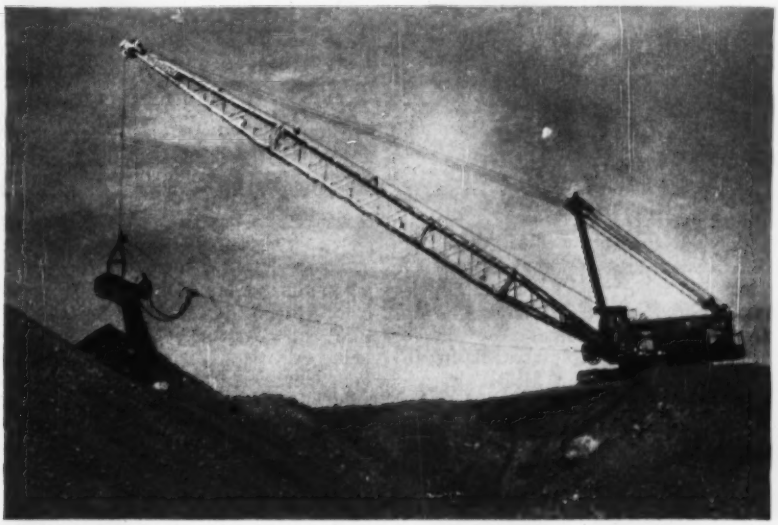
—"partnership" at a local level
—a single $92-million contract
—4-year construction schedule



FIRST WORK IN THE RIVER was construction of a temporary cofferdam across the left river channel that will permit construction of stage Ia cofferdam in slack water.



COFFERDAMS will be built in three stages. Feature is a high cofferdam around the powerhouse that will permit work uninterrupted from flooding in that area. Note that the left embankment is offset upstream to facilitate future expansion of the powerhouse.



FIRST WORK ON THE DAM is excavation of the cutoff trench for the left embankment. A substantial grouting program must be completed before work can start on the powerhouse.

SHEET PILING IS UNLOADED for cofferdam use. Contractor has had some difficulty getting enough sheet pile.

Work Starts on Biggest Single Contract

Exciting events are taking place on the Columbia River out in Washington. Focal point is Priest Rapids Dam, a power development that will produce 630,000 kw for Pacific Northwest power users.

There's the tense excitement of getting a big new job under way—the $92-million contract is the largest in construction history. There are the uncertainties of establishing a construction schedule wherein a definite amount of work must be done each low water season for four years; penalty for not getting the necessary work done is a year's loss of time with resulting unrecoverable loss in power production. And there's the fascination of a relatively obscure local public utility undertaking one of the biggest jobs of these times.

• **Partnership project**—The Priest Rapids project is an outstanding example of partnership on a local level. Financing has been accomplished without a cent of tax money through the cooperation or "partnership" of both publicly and privately owned local utilities. The federal government in this instance is just a spectator on the sidelines.

Rapidly increasing power demand in the Pacific Northwest during the last decade has made it clear that construction of new generating capacity must continue. In 1952, the Corps of Engineers had under construction three big Columbia River projects—McNary, Chief Joseph and The Dalles. These, together with smaller non-federal jobs, guaranteed the area enough new power to meet growing demands until at least 1959–and perhaps 1960 or 1961. But the question remained: Where was new power to come from after 1960?

Grant County Public Utility District was one local unit with meteoric

Priest Rapids: king-size project for small utility

RUNNING THE JOB are (l. to r.) Russ Hoffman, Robert B. Jackson and Robert J. Jenks. Hoffman and Jenks are project superintendent and project manager for Merritt-Chapman & Scott. Jackson is resident engineer for Harza Engineering Co.

growth to look forward to that was concerned with future power supplies. With no generating facilities of its own, Grant County PUD at present buys its power from the Bonneville Power Administration. Officials of the district had considered Priest Rapids Dam as a possible power source for some time—the dam spans the Columbia between Grant and Yakima counties with the bulk of the development in Grant County.

In 1952, PUD officials consulted with the Corps of Engineers and found that the federal government had no plans for constructing Priest Rapids in the near future—even though it was authorized as a federal project. So, under the leadership of Manager G. A. Smothers, the utility started condemnation and planning work on the project. Harza Engineering Co., Chicago, was engaged for feasibility studies and engineering design.

First step was to push through Congress a bill amending authorization of Priest Rapids as a Corps of Engineers project and permitting local interests to undertake the work. This was accomplished with almost no opposition. And certain measures had to be pushed through the state of Washington legislature.

During this period, engineering studies led to the conclusion that it would be more feasible to build two low dams—one at Priest Rapids and another (Wanapum) about 18 miles upstream—rather than a single high dam at Priest Rapids. This plan was submitted to the Federal Power Commission in seeking a license for the project.

Laws under which the FPC operates assign first rights to the publicly owned utilities. And, as Grant County PUD was the first such utility to ask for the Priest Rapids license, it was relatively sure of getting it.

But, one can very well ask, how can such a small area as Grant County finance such a big project as Priest Rapids Dam. Washington's Grant County includes a large amount of the Bureau of Reclamation's Columbia Basin Irrigation Project. The USBR started delivering water to project lands in 1952. And it is halfway through a 10-year program that by 1961 will bring water to more than half a million acres of farmland. This has assured a growing economy for the area. Even so, there are at present only about 50,000 people in Grant County's 2,691 sq mi—an area larger than either Delaware or Rhode Island. This compares with a 1950 population of 22,000.

To finance the work, Grant County PUD conceived the idea of underwriting the cost of the project by revenue bonds backed up by firm contracts for sale of the power. Result was contracts with 12 utilities for definite percentages of the power. These utilities include small municipal systems in Oregon, other public utility districts in Washington, large city systems in Washington and the four big privately-owned utilities that also serve the area (see table). Each of these agencies is entitled, over a 50-year period, to receive a definite percentage of the Priest Rapids power output. In return, each agency must pay its percentage of operating and maintenance costs plus debt service. These same percentages also apply to Wanapum Dam, a 570,000-kw facility just upstream which Grant County PUD expects to construct in the not-too-distant future.

Grant County PUD has reserved 36.5% of the power output—and cost—for itself. This 229,950-kw is much greater than the present 100,000 kw Grant County PUD load. The excess will be sold on a short-term basis to other utilities with power withdrawn from such sales as needed by Grant County PUD. Even with this large excess and including Wanapum, Grant County PUD officials expect to have to develop other power sources within 20 years. And after the 50-year contract period, the entire output of Priest Rapids and Wanapum will, if necessary, be available for Grant County's exclusive use.

In summary, the financial feasibility of the Priest Rapids project is established by a true partnership of local utilities—both publicly and privately owned. Also, there are no tax obligations involved, the entire financing being from revenue bonds underwritten by power sale contracts.

• **Largest construction contract**—Financial advisors for Grant County PUD believed that it would be best to have a firm bid for the cost of the work to be able to market the bonds—in spite of the contracts for sale of power. That accounts for including the entire job in one bidding. Some have criticized sale of the entire bond issue ($166 million) in advance of construction as being excessively costly due to the high interest payments during the construction period. The answer given is that this assures complete financing before any construction is started, and, that the bond money can be reinvested on a short-term basis until needed to pay construction costs, thus reducing the construction period interest charges.

The contract includes the entire project except for transmission lines and some minor PUD-supplied equipment. Generators, turbines, switch gear, access roads and the like come under the main construction contract.

When bids were opened on March 12, 1956, it was found that Merritt-Chapman & Scott Corp., New York, was low for a figure of $91,880,625. Of this amount, $56,673,775 is for construction; the remainder, for turbines, generators, insurance and the like. For example, the eight 83,000 kva generators cost a total of $12,540,000.

As with the bond sale procedure, there has been some discussion as to the advisability of placing the entire job under a single contract. Some contend that a general contractor is only acting as a middleman in the purchase of turbines and generators and that general

Close-up view of the Cat D9 push-loading a DW21 and scraper near Globe, Ariz. Twin Disc Torque Converter components are standard in the torque converter version of the powerful D9 and D8. Inset (left) shows Roy E. Hale, Superintendent, and Link L. Colvin, Co-owner of Copper State Construction Co.

"Torque converter gives the Cat D9 that extra 'boost' when you need it"

Roy E. Hale, Superintendent, Copper State Construction Co.

When Copper State Construction Co., Mesa, Ariz., took on the contract for building a clover-leaf on U. S. Highway 70 about 20 miles east of Globe, Ariz., it had to move some 70,000 cubic yards of earth—fast and profitably. So one of the powerful Cat D9's (equipped with Twin Disc Torque Converter components) was put on the job, push-loading Cat DW21's and scrapers.

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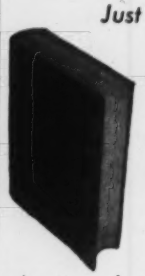

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Priest Rapids: Controversial and complicated bidding

contractors are not intimately familiar with design criteria and installation procedures. On the other hand, all the officials connected with the Priest Rapids job are convinced that there is a lot to be gained by placing entire responsibility for the job in the hands of one organization.

To make the job more attractive for bidding, a year was added to the time that was estimated as needed to complete the contract. Result is that the contractor is allowed 1,900 days to do the work. This time period started with actual award of the contract on July 9, 1956. The only reasons for time extensions are earthquakes and acts of war. And there is a stiff penalty that approximates the interest charges. This penalty is $3,000 per day per generating unit or a total of $24,000 a day. But, because a penalty clause is only good if there is a compensating bonus clause, the contractor will receive $1,300 a day for each unit in service before the contract completion date. This amount is roughly equivalent to the anticipated daily income from each generator less maintenance and operating costs. Merrit-Chapman & Scott has set its construction schedule up to have the entire job completed in 1,500 days. If this works out, they could receive a completion bonus in the neighborhood of $4 million.

One remarkable phase of the bidding is that the successful low bidder for the huge job is a single contracting organization rather than a joint venture of several contractors, as were the other four bidders.

There are literally hundreds of contract items. On construction of the dam proper the major items are excavation, embankment on the earthfill wings and concrete. Excavation items in the contract total 3,239,000 cu yd. Biggest single item is 767,000 cu yd of powerhouse excavation in basalt rock bid at $4 per cu yd. Embankment or fill items total 3,352,000 cu yd. Biggest fill item is pervious fill totalling 2,150,000 cu yd bid at $0.50 per cu yd.

There is more than 900,000 cu yd of concrete in the dam, with more than half of this going into the powerhouse structure. The concrete bid items are broken down into several parts. Mixing and placing the powerhouse concrete was bid at $13.50 a cubic yard. Providing the 750,000 bbl of cement needed on the job was bid at $5.50 a barrel. Formwork was a separate item, with straight forms bid at $1.60 per sq ft and curved forms at $3 per sq ft. The 60,000,000 lb of reinforcing steel was bid at $0.12 a pound.

• **Design not unusual**—There are apparently no unusual design features in Priest Rapids Dam. Except for a slight offset of the left embankment, the dam is on a straight line across the river for a total of 9,312 ft. This includes right embankment (earthfill) 1,900 ft; concrete gravity dam, 260 ft; spillway, 1,142 ft; powerhouse including assembly bay, 1,025 ft; and left embankment, 4,085 ft.

The spillway, with an ogee crest at El 436.5, has 22 openings. Each opening has a 40x50-ft tainter gate putting maximum controlled water level at El 486.5. It is designed to pass a 1,400,000-cfs flood. Maximum on record is 692,000 cfs.

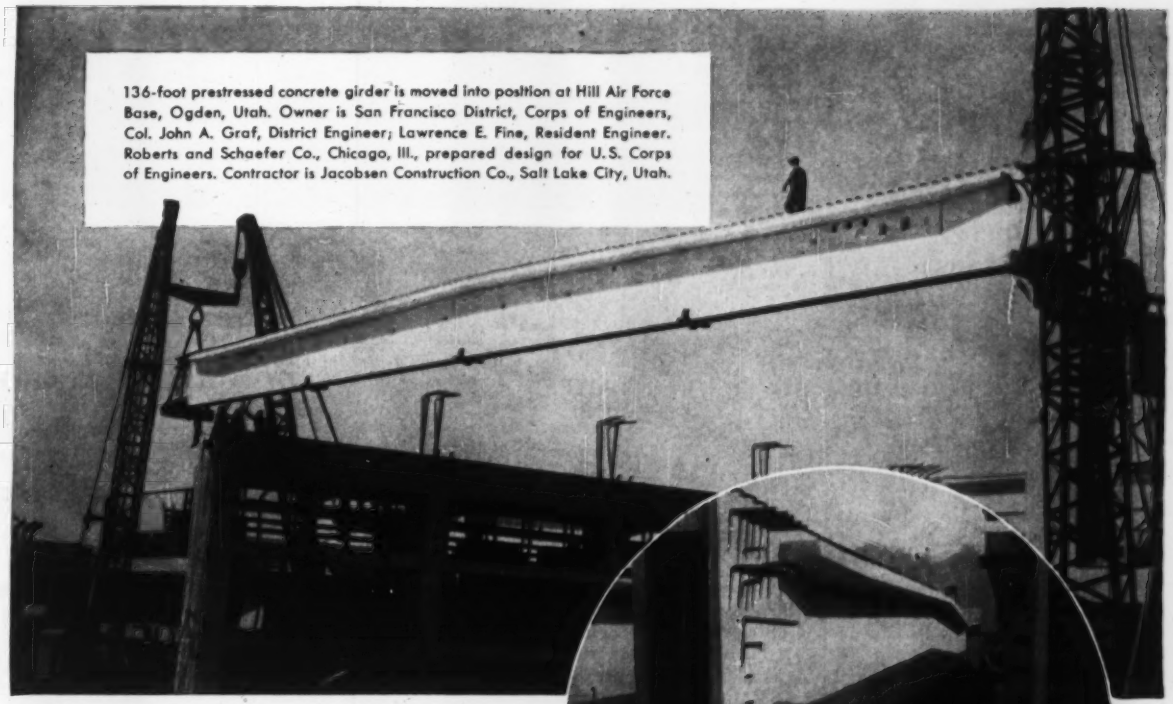
The powerhouse will have eight 83,000-kva units each powered by a 114,000-hp Kaplan turbine operating at 78 ft rated head. Two additional powerhouse bays are being constructed to provide space for future units. And provision is being made for addition of even more units should additional upstream storage make it worthwhile. To permit construction of the necessary additional powerhouse bays without extensive cofferdamming, the left embankment is offset upstream from the powerhouse (centerlines are 291 ft apart).

At present there is no federal participation in the project. But at some future date it may become desirable to construct a navigation lock through the dam. Accordingly, the current program includes additional excavation on the right abutment that will facilitate installation of a cofferdam for lock construction.

The site is underlain by massive basalt flows that dip toward the left abutment. This gives good rock foundation under the spillway and powerhouse sections. But the basalt dips away at the left abutment. To minimize seepage at this point, a 1,000-ft section of the bank upstream from the dam will be protected by an impervious earthfill blanket.

• **Cofferdam sequence**—Merritt-Chapman & Scott has set up the job on a four-year construction schedule. It figures that no matter how you look at the job, work must be done in the river during three low-flow seasons—October to April.

But feature of the construction plan is a high cofferdam around the powerhouse, which will permit uninterrupted work in that area. This is in contrast to work at McNary and at The Dalles where one or more times during the construction program the powerhouse area was flooded. The powerhouse cofferdam will reach El 450 on the upstream side and El 435 on the downstream side. It is pegged at containing a flood like that in 1956, one of the



136-foot prestressed concrete girder is moved into position at Hill Air Force Base, Ogden, Utah. Owner is San Francisco District, Corps of Engineers, Col. John A. Graf, District Engineer; Lawrence E. Fine, Resident Engineer. Roberts and Schaefer Co., Chicago, Ill., prepared design for U.S. Corps of Engineers. Contractor is Jacobsen Construction Co., Salt Lake City, Utah.

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Prestressing concrete with Truscon Stressteel Tensioning Bars can increase strength, cut dead-weight, conserve materials, allow longer spans. Like more facts? Write Truscon for the Truscon Stressteel Design Manual.

T-shaped prestressed girders vary in depth from 6′ 4″ at ends to 7′ 6″ at center. Total final prestressing force is 1368 kips. This force is applied by 18 Truscon Stressteel High Strength Alloy Steel Bars, 1⅛″ in diameter.

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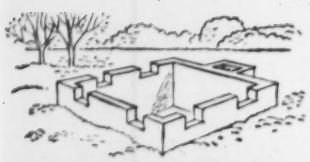

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. . . Allocation of Priest Rapids Power

Agency	Percentages	Kilowatts
Pacific Power & Light Co.	13.9	87,570
Portland General Electric Co.	13.9	87,570
Puget Sound Power & Light Co.	8.0	50,400
Seattle City Light	8.0	50,400
Tacoma City Light	8.0	50,000
Washington Water Power Co.	6.1*	38,430
Cowlitz County PUD	2.0	12,600
City of Eugene, Ore.	1.7	10,710
City of Forest Grove, Ore.	0.5	3,150
City of McMinnville, Ore.	0.5	3,150
City of Milton-Freewater, Ore.	0.5	3,150
Kittitas County PUD	0.4	2,520
Grant County PUD	36.5	229,950
Total	100.0	630,000

*Includes 4.0% specifically allocated for use in Idaho and Montana.

highest on record. (Cofferdam elevations compare with the finished dam crest at El 499.5, maximum controlled headwater above the completed dam at El 486.5, and spillway crest at El 436.5.)

Biggest bottleneck in the early stages of the project has been acquiring enough steel sheetpiles. (There will be 23 cofferdam cells in stage Ia work and 40 smaller cells in stage Ib work.) This was hampered to some degree by last summer's steel strike. The sheetpiles are coming from wherever available, including some from construction work at The Dalles Dam.

The powerhouse or stage Ia cofferdam is going in now. And it should be completed substantially in advance of the 1957 flood season. In addition to 23 sheetpile cells, the stage Ia cofferdam will include long earth dikes both upstream and downstream. The dikes center on and provide stabilization for sheetpile cutoff walls. A temporary earth dike has already been thrown across the left river channel to permit the stage Ia cofferdam to be constructed in slack water.

Once the powerhouse area is protected, work will start on the stage Ib cofferdam, which will include one half of the spillway. MC&S will attempt to get this cofferdam completed before the 1957 flood season. And their schedule calls for completing the left half of the spillway before the 1958 flood season. This low cofferdam will be at El 425 on the upstream side and El 420 on the downstream side. This is expected to flood during the high water season.

During the 1957-58 low water season, MC&S plans to complete the left half of the spillway except that the ogee crests will be left low. During later construction stages the river will be turned through these sections.

During the latter part of the 1957-58 construction season stage II cofferdam will be built. This consists of three sheetpile cells plus connections that will tie the stage Ia cofferdam to the completed structural mass of the powerhouse. This must be completed soon enough to permit construction of that part of the spillway immediately adjacent to the powerhouse before the 1958 flood season. Stage Ib cofferdam will be removed to permit 1958 flood waters to pass through the entire spillway area.

Final cofferdam—stage III—will be constructed during the 1958-59 low water season. It is expected that the right bank part of the spillway will be completed inside this cofferdam before the 1959 flood season. Final work on the low bays on the left half of the spillway will be completed during low-water season of 1959-60 which is just in time to generate power by mid-1960.

To date, most construction effort has been spent on accumulating material. A 15-mi access road is being built from Beverly, Wash. And the necessary job site facilities are being constructed. This includes a shop building, an office building for the contractor, an office building for the engineers, and the like. There will be no workmen housed at the site, and there is no necessity for a job messhall. Reason is that there is believed to be enough capacity in nearby towns to handle the workmen. Some will drive as far as Ephrata—county seat of Grant County—which is 60 miles away.

The contractor is also constructing a bridge across the river just downstream of the dam. The bridge will be founded on bearing piles and timber cribs. It will have 100-ft span glued-laminated timber girders.

• **Management**—G. A. Smothers is manager of Grant County Public Utility District, and R. R. Ries is chief engineer.

Design and construction supervision of the work is being handled by Harza Engineering Co., Chicago, under the direction of Calvin V. Davis, president, and E. Montford Fucik, executive vice president. Robert B. Jackson is resident engineer for Harza. He is assisted by Bert Hall, assistant resident engineer, and W. L. Scearce, office engineer.

Robert J. Jenks is project manager for Merritt-Chapman & Scott, and Russ Hoffman is project superintendent.

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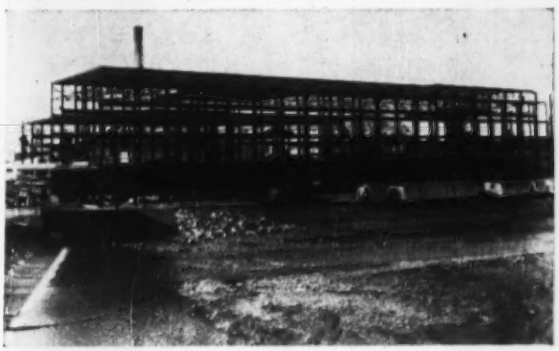

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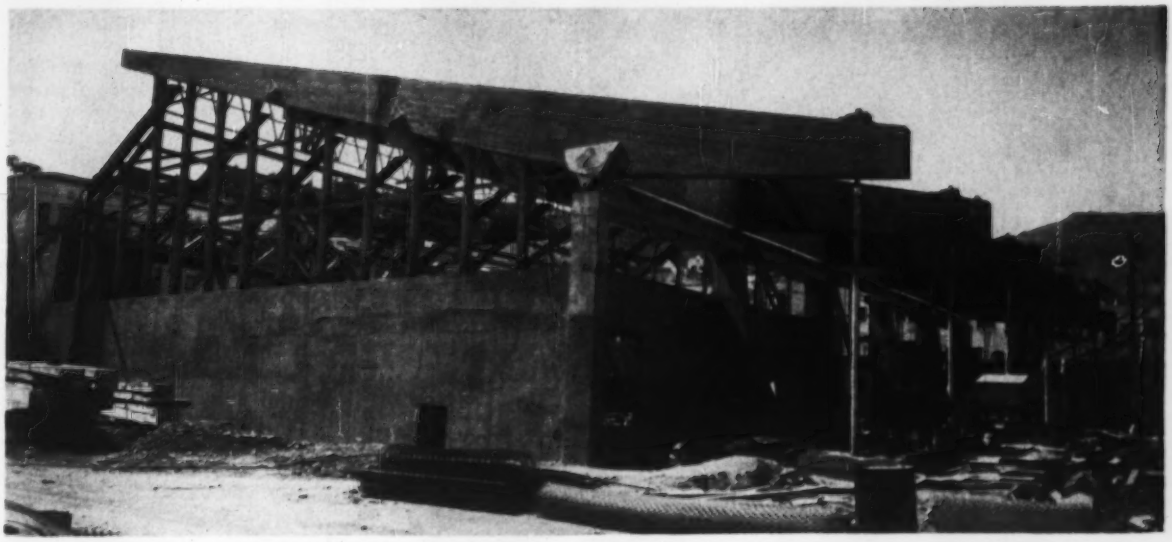


Tied down to a 200-ton concrete deadman . . .

Wood Cantilevers Support Arena Roof

In an unusual structural arrangement, the roof of an 80x110-ft park-department fieldhouse in San Francisco is framed with glulam timber beams that cantilever over the interior from both sides of the building.

As in conventional pitched-roof construction, the roof beams of the Upper Noe fieldhouse slope upward from the walls, so that the roof deck forms two planes. Differing from ordinary framing, however, the two planes are not dependent on one another. They don't meet along a conventional ridge line. In fact, they don't meet at all.

One slope—with 35-ft beams, 11 ft c-c, rising on a 7 in 12 pitch—stops just short of intersecting the opposite side. The latter—with 94-ft beams, 22 ft c-c, on a 3 in 12 pitch—continues about 12 ft farther and overhangs shorter slope.

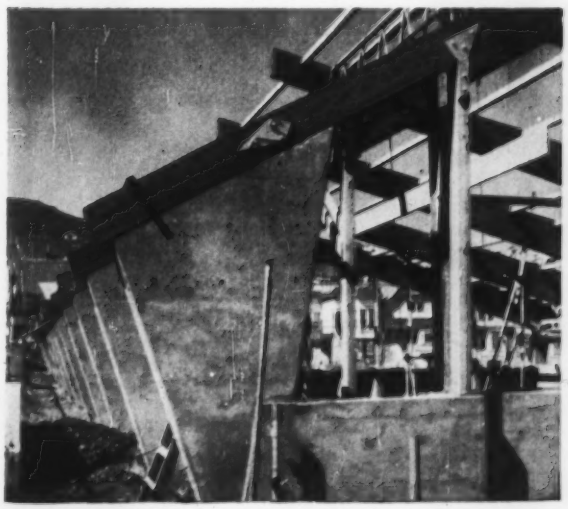
Clerestory windows close the opening under the overhang. The deck on both slopes consists of 2-in. wood plank (1⅝-in. net thickness) supported on wood purlins framed between the glulam beams.

To resist the cantilever moments of the beams, two support systems were devised:

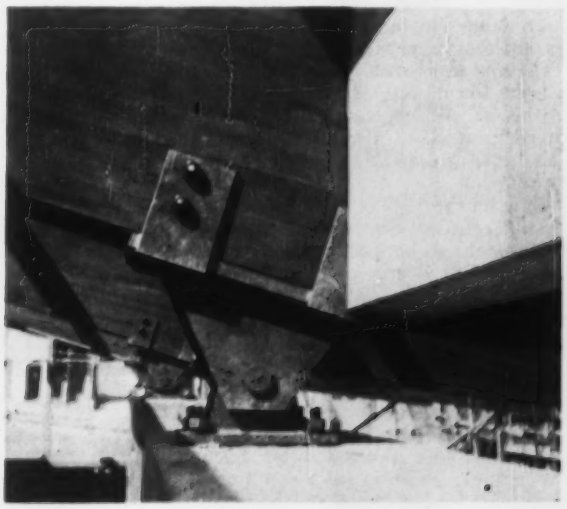
1. The 94-ft beams are hinged-connected on top of pilasters at the wall and extend 20 ft outside. Vertical rods 2¼ in. in diameter, with upset threads, tie the outside ends to a continuous 6x4-ft concrete deadman.

2. On the other side, the 35-ft beams are anchored at the wall to concrete pilasters and bear on wood columns about 7 ft inside the wall.

To prevent rippling or uneven deflections of the roof system under wind loads, beams from both sides of the building are connected to a parallel-chord steel truss that runs the length



PILASTER at wall and steel-capped wood post 7 ft inside support 35-ft beam. Showing at upper right is steel stiffening truss.



HINGE CONNECTION supports 94-ft beam at wall, 74 ft from cantilever tip. Framing in at right is box-section bracing strut.

Wood beams cantilever 74 ft.

ROOF FRAMING is braced laterally by box-section members (1) and deep solid members (2), interspersed with shallower purlins. (Also see photo below.)

of the building, underneath the overhang. The truss also supports the clerestory windows.

The truss has a secondary purpose, too—to transfer loads from any beam to its neighbors in case of failure or severe overload. This is not due to lack of confidence in the structural performance of the roof system, but rather because the vertical tie rods that anchor the outer ends of the long beams are within easy reach of vandals. As a deterrent to tampering—and to moisture damage—the rods are encased in steel sleeves.

The roof structure is stiffened laterally in every bay by bracing struts between the beams. In the end bays, bracing trusses parallel to the roof transmit lateral loads from the roof members to the sidewalls.

Between the 35-ft beams—9 in. wide, 14½ in. constant depth—three lines of 6x10's double as both purlins and struts. Other purlins in this part of the roof are 6x6's.

Between the 94-ft beams—which vary in depth from a maximum of 66⅝ in. at the wall to 26 in. at the cantilever end and 34 in. at the tip of the outside extension—bracing struts are wood box sections, constructed with 8x10-in. flanges and ⅝-in. plywood webs. Each line of these members has a depth corresponding to—but less than—the beam depth at the point of application.

In the end bays of both slopes of the roof, the rectangular panels formed by the cantilever beams and the bracing struts are converted into bracing trusses by the addition of double-angle steel diagonals.

Roofing material on the wood deck of the fieldhouse is corrugated asbestos-cement on the short slope, layers of felt and sprayed-on plastic on the longer slope.

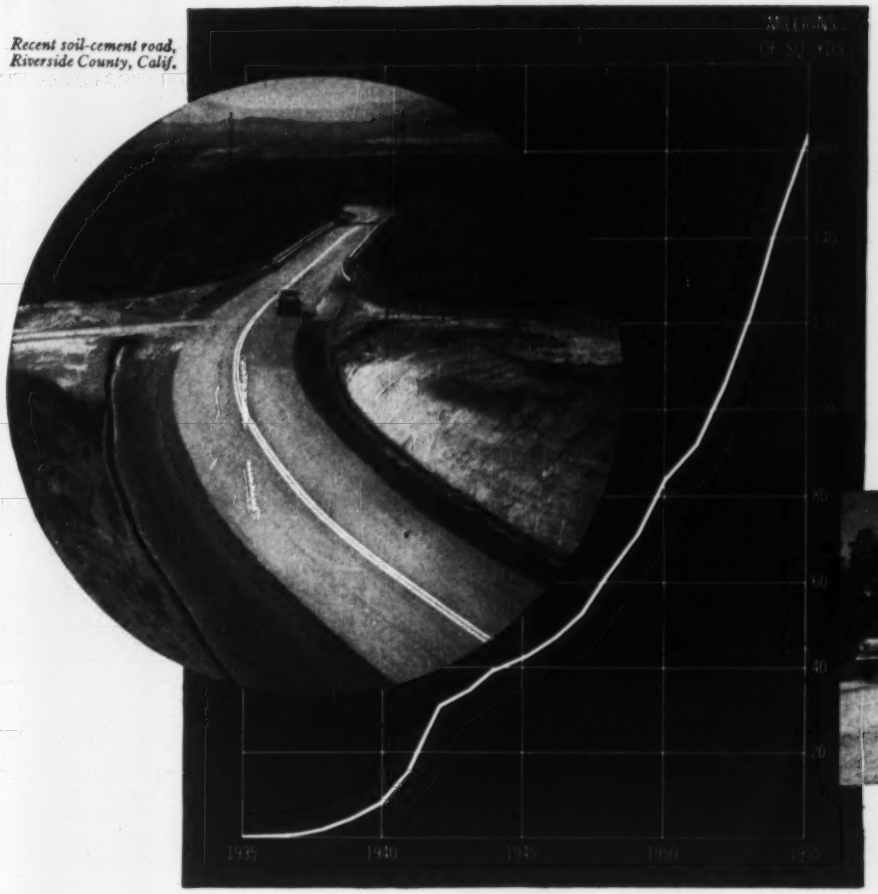
Sidewalls of the building are continuous concrete, with integrally cast pilasters. Endwalls are concrete near the ground, plastic panels in steel sash above. Openings between roof and endwalls provide ventilation for interior.

The project also includes an adjoining 52x80-ft auditorium, with a pitched roof framed by glulam beams. The beams on one side are supported, like the shorter beams in the fieldhouse, on concrete pilasters and wood columns. The columns are 12 ft inside the wall. The beams rising from the opposite side are simple spans supported at one end by the wall, at the other by the cantilevered members. Opposing beams meet about midway the building to form a ridge line.

Contract cost of the job, including both buildings, site development, landscaping and playground, is $429,000. Completion is scheduled for January.

Donald Beach Kirby & Associates, San Francisco architects and engineers, designed the buildings. Ted Moulton and Baird Heffron were in charge of architectural and structural design, respectively, for the Kirby firm. James I. Barnes Co., Redwood City, Calif., is the general contractor. George Harman is supervising engineer for the San Francisco park department. Timber Structures, Inc., Portland, Ore., laminated and fabricated the beams. They were erected by Timber Structures of California, Inc., Richmond, Calif.

IN END BAYS, double-angle steel diagonals convert roof beams and bracing members into bracing trusses, parallel to roof planes.



Recent soil-cement road, Riverside County, Calif.

America's first scientifically-controlled soil-cement road. Rt. 41, near Johnsonville, S. C. Built in 1935, this photo was taken in 1955.

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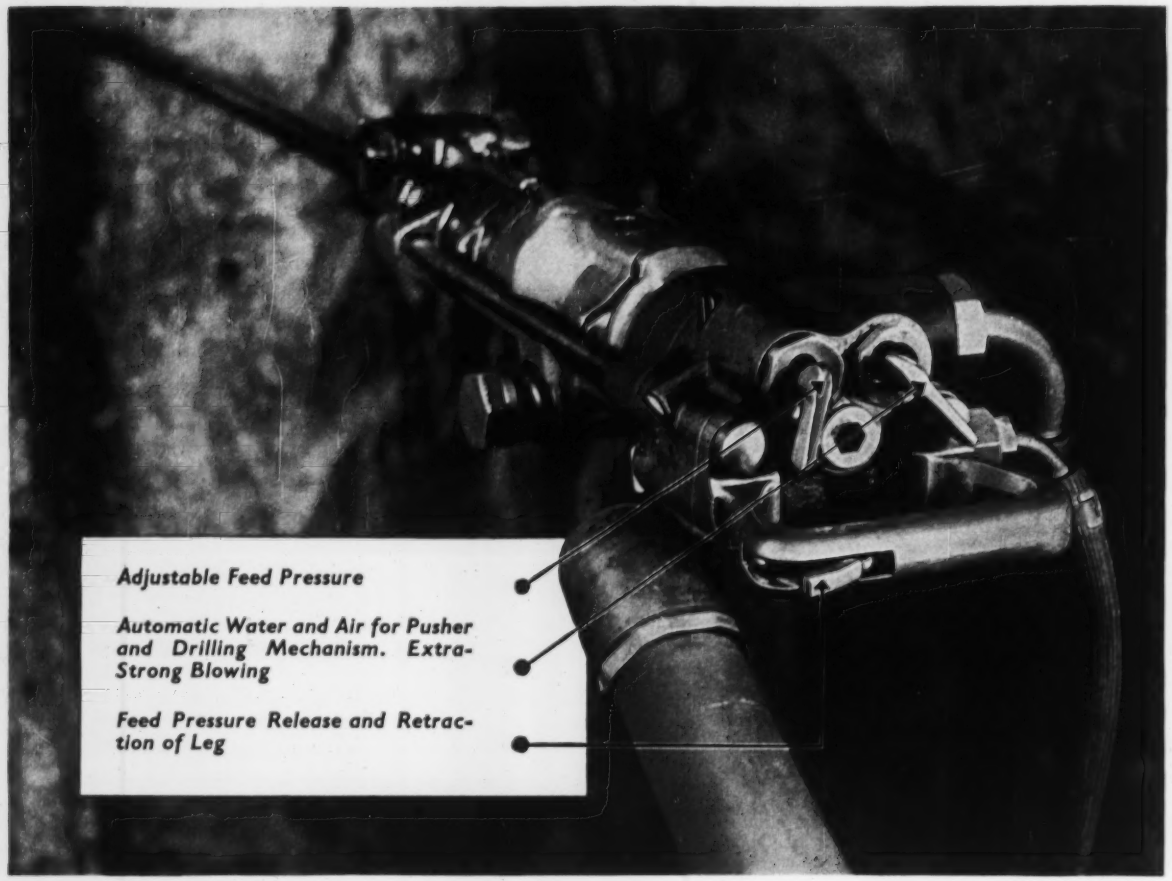
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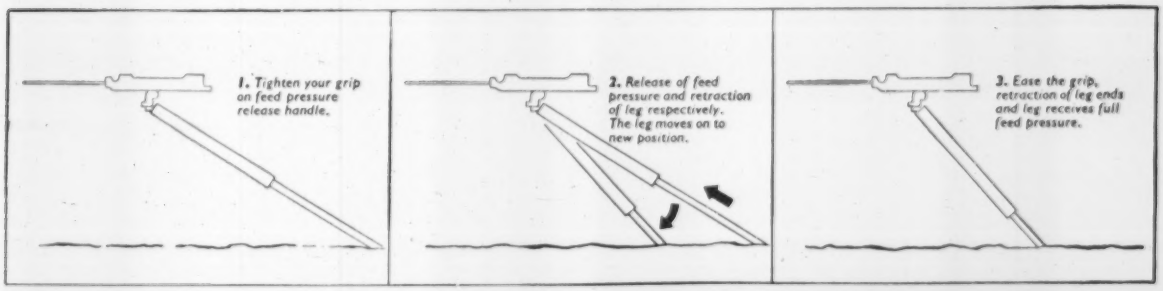
Retractable leg saves time

When the leg has to be moved the feed pressure is easily released by squeezing the hand grip. By further pressure on the grip the leg retracts automatically.

Pusher leg moves forward with drill in full action


1. Tighten your grip on feed pressure release handle.
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3. Ease the grip, retraction of leg ends and leg receives full feed pressure.

When the leg is in the new position suitable for continuous drilling, retraction stops and the feed pressure comes back by loosening the grip of the hand. *All this can be done while the drill is still running.*

This new idea of a retractable leg enables quicker repositioning of the leg and reduces the number of steel changes, thereby increasing footage per manshift. When drilling high holes it is now far easier to alter the position of the leg more frequently in order to maintain an optimal feed angle and feed pressure.

Packed with power for deep holes

The Lion has a drilling rate at least 30% higher than other rock drills of the same weight. Furthermore, it is designed so that it can maintain its high speed *even when drilling deep holes.* This means quickly drilled deep hole rounds and a faster, steadier advance. You'll also find that the Lion reduces *to a minimum* the gauge wear of the bits in abrasive rock. And owing to the ease with which the feed pressure is released and brought back into action, the Lion is a *handier* drill to work with in fissured rock.

Sandvik Coromants—the right steel for the Lion

All Atlas Copco drills—and this goes for the Lion—have been developed from the earliest stages with Sandvik Coromant tungsten-carbide-tipped integral steels and detachable bits. No drill or steel developed separately could ever give such equivalently high performances as this drilling combination. It is today the most widely used in the world, responsible for drilling more than one billion feet per year.

Free Demonstration! *Wire, 'phone or write* today *to any one of these offices and see the Atlas Copco Lion in action for yourself.*

U.S., Atlas Copco Pacific, Inc., 930 Brittan Avenue, San Carlos, California. Atlas Copco Eastern, Inc, P.O. Box 2568, Paterson 25, N.J.

CANADA, Atlas Copco Canada Ltd., Montreal Airport, P.Q.

MEXICO, Atlas Copco Mexicana S.A., Apartado 56, Torreon, Coahuila.

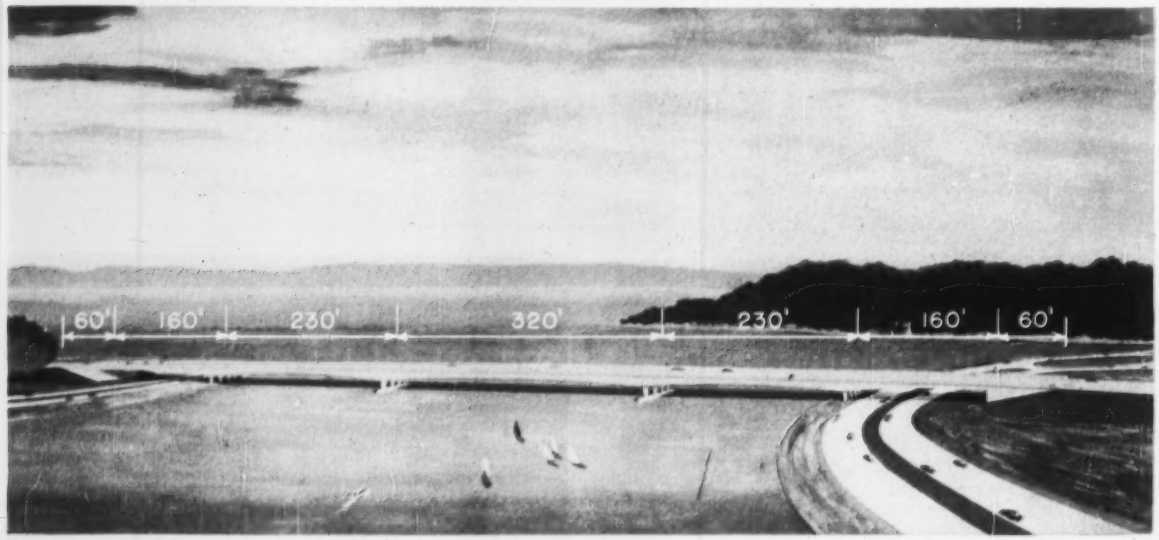
The ATLAS COPCO GROUP puts compressed air to work for the world. It is the largest group of companies specializing solely in the development and manufacture of compressed air equipment. It embraces Atlas Copco companies or agents manufacturing or selling and servicing Atlas Copco equipment in ninety countries throughout the world.

Without changing the grip of the hand the driller can easily position and control the machine, saving time and reducing fatigue.

Atlas Copco

DS59

Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment



NARROWS BRIDGE, at Perth Australia, will be 1,100-ft long, five-span continuous structure of prestressed concrete.

Australia To Build 320-Ft Prestressed Span

PILE DRIVERS with interior-type drop hammers are now sinking 30-in. steel casings through 120 ft of organic mud, sand and clay to limestone bedrock.

Foundation construction for what may be Australia's biggest prestressed concrete bridge is now underway on the Swan River in Western Australia. The bridge will link Perth and South Perth across a section of the river known as The Narrows, about 10 miles above the seaport town of Freemantle.

The structure will comprise five girder spans, maximum 320 ft, for a total length of 1,100 ft between abutments. Eight lines of the girders will carry an 80-ft wide deck—six roadway lanes and two 10-ft walks.

The girders will be precast on the site in 20-ton elements and assembled with mortar joints and stressed coupling units into construction sections. Floating cranes will ferry the sections out to the piers and set them. Maximum section length will be 370 ft. The heaviest lift will be 470 tons.

Post-tensioning will provide full-length continuity of the girders. The structure will also be post-tensioned transversely and then deck concrete will be cast in place.

The girders will bear on four piers consisting of precast concrete columns, supported in turn on reinforced concrete pile caps. Piles are concrete-filled steel casings. Column-base connections will be rocker type, allowing motion toward either end of the bridge.

Limestone bedrock at the site lies 120 to 130 ft below the river bed. Overlying strata are soft organic mud (50 to 80 ft) and sand and clay (up to 60 ft). The pile-driving method employed is to fill the bottom of a 30-in. steel casing to 30-ft depth with concrete, embed a steel anvil, and then sink the casing by striking the anvil with a 40-ft long 22-ton interior drop hammer.

Additional casing sections are welded on as needed. Reinforcing steel is lowered into the casing after bedrock is reached, and the casing is then filled with concrete.

Superstructure bids for the bridge are due in February. Completion is scheduled for 1959.

Designers of the bridge are G. Maunsell & Partners, civil engineers. William Holford & Partners are the architectural consultants, and E. W. H. Gifford is the advisor on prestressing.

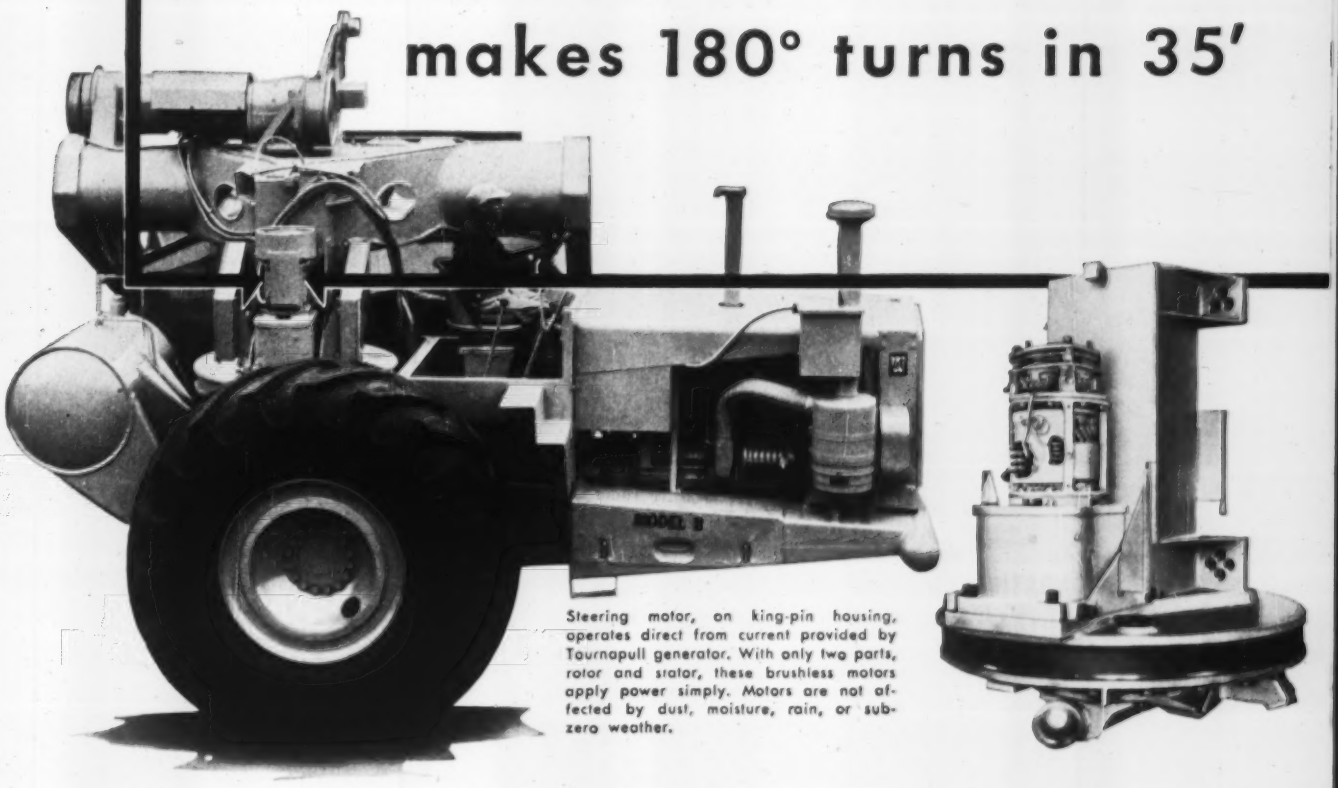
$5-Million Suspension Bridge Planned to Cross Tigris River

The Government of Iraq has announced engagement of D. B. Steinman, New York City consulting engineer, to design and supervise construction of a suspension bridge to span the Tigris River in Baghdad.

To be called the Kerradah-Baghdad Bridge, the structure is estimated to cost about $5 million and will be a major link in a highway leading to the city's airport.

BIG 25-yard "B"

makes 180° turns in 35′



Steering motor, on king-pin housing, operates direct from current provided by Tournapull generator. With only two parts, rotor and stator, these brushless motors apply power simply. Motors are not affected by dust, moisture, rain, or sub-zero weather.

The BIG B Tournapull turns around without backing in a space only 35′ wide . . . over 5′ less than its 40′6″ over-all length. This 90° turnability lets you work in restricted areas and on narrow fills where other big scrapers cannot operate.

Maneuvers in close quarters

No steering jacks or other structural parts interfere with "B's" full 90° turns. Positive geared steer on king pin helps to maneuver fast in close quarters. These advantages mean bigger production in less time, and eliminate need for costly construction and maintenance of special turn-around areas needed for other rigs.

"Feather-touch" steering

Little effort is required to steer the B Tournapull. Electricity does all the work. Operator never has to "fight" steering wheel, no matter how tough the going.

An electric motor mounted on steering king pin turns a heavy-duty ring gear mounted on prime-mover. As ring gear turns, prime-mover pivots on the king pin. Prime-mover continues to turn as long as steering wheel is rotated. The instant this rotation is stopped, a brake automatically locks the steering motor. Tournapull then continues to travel in the selected direction, regardless of underfoot conditions, until wheel is again rotated and action repeated.

"B" walks out of soft spots

Positive electric power-steer makes it easy to work BIG "B" quickly out of a soft spot. Rotating wheel back and forth causes prime-mover to swing from side to side. This "walks" the drive wheels to fresh footing and moves trailing unit ahead with each swing of the prime-mover.

Why not find out for yourself how the BIG 25-yard B Tournapull, with its mudability and 180° turnability, can help you get bigger pay-yards on your earthmoving. Ask for owner-verified reports on "B" production.

Tournapull—Trademark Reg. U.S. Pat. Off. BP-964-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

In addition to replacing several piles with one belled caisson thereby eliminating a pile cap, belled caissons are replacing spread footings on more and more jobs because of the economies and the speed-up of the job.

CASE FOUNDATION CO.
Rt. 1—Roselle, Ill.
Phone (Chicago)....Austin 7-3584

FOR SAFE AND SPEEDY HOISTING

Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service.

Our special service departments will help you with their recommendations. Write for our catalog or consult your equipment dealer who can supply you with MADESCO products.

MADESCO BLOCKS
MADESCO TACKLE BLOCK CO.
EASTON, PA.
Engineered to Serve Your Special Service Needs

Underwater TV

Camera designed for use in inspection, has video tape device for keeping records

An underwater television system, developed by HEC Corp. for government agencies, is now available commercially. It will take pictures under water and transmit them to a screen via closed circuit television.

The manufacturer says the camera may be towed for inspecting canals, nets, and trawls. It also is expected to be valuable in offshore drilling operations. If later review of the televised information is desired, it can be recorded on tape with an Ampex video tape recorder, and played back minutes or years later.

The system makes use of an ultrasensitive television camera mounted inside a watertight, stainless steel cylinder 11 in. in dia. and 29 in. long. The camera assembly weighs 95 lb out of water, but only 12 lb. in water. Focus and iris can be controlled from a viewing screen which can be located several hundred feet away.

Although the camera may be maneuvered by a diver, it also can be handled by a crane, especially when used in depths greater than 200 ft. An intercommunications system permits divers to keep in touch with personnel at the viewing screen.

Equipment was first used by the Interior Department's Fish & Wildlife Service, for underwater exploration of marine life, and the Navy's Bureau of Ships for hull inspection and salvage operations.

The so-named Hancock system was demonstrated in September 1955 at California's Shasta Dam for the Bureau of Reclamation, for inspection of spillway erosion—HEC Corp., Redwood City, Calif.

Backhoe for Light Tractors Has 170-Deg Swing, 4,800-Lb Bite

A new hydraulic backhoe for light tractors digs slightly more than 12-ft below ground surface and has a full swing of 170 deg. through three quadrants of operation. Shifting from one quadrant to another can be performed from the operator's position.

The machine produces digging power of over 4,800 lb at the bucket teeth. One hydraulic cylinder above the main boom pushes on an extension of the bucket boom synchronously.

The "Warrior" as it is called, is protected by an hydraulic bypass setting of 1,400 psi. The unit is designed so that it can be installed or removed from the tractor in a matter of minutes. Individually controlled hydraulic stabilizers align the unit for plumb diggings on slopes, with the wheel on a curb, etc. It is adaptable for mounting on all popular makes and models of light industrial tractors. Shawnee Mfg. Co., Inc., 1947 N. Topeka Ave., Topeka, Kan.

Portable Gantry Crane Can Be Adjusted in Height

An adjustable-height gantry, said to be light enough to be erected by two men, may now be obtained.

Maximum height is more than 14 ft, legs have 6-ft adjustments to permit setups over high obstructions or where headroom is low, or over pits or cramped quarters where each leg may require a different adjustment. The I-beam, made of aluminum alloy, weighs only 65 lb.

Each end support is a complete tripod. B. E. Wallace Products Co., Easton 20, Pa.

Strips of Plastic Simulate Grout Between Plastic Tiles

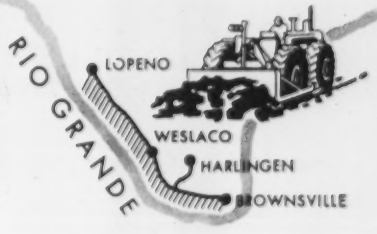
Simulated grout now is made by a Plastic-tile manufacturer. It comes in narrow strips of white dull-finish plastic, $\frac{1}{16}$ in. wide and $\frac{1}{8}$ in. deep. Set between bathroom or kitchen-wall tiles, in the same bed of mastic, the strips present the appearance of grout.

When setting a course of tile, the workman alternates tiles with short vertical lengths of the strip. Between courses, he sets longer horizontal strips.

Special strips are available for use with bull-nose cap, outside corners and cove molding. Artcrest Plastics Co., Inc., 255 W. 79th St., Chicago, Ill.

Operator Luis Moody blades good-sized load up 3-to-1 slope to levee. Boundary commission uses its Tournatractor extensively for fast, regular maintenance of levees on 256-mile border system.

The Rio Grande valley is a rich agricultural area, growing citrus fruits, cotton, and vegetables. Subject to flood-producing downpours in spring, and infrequent rain the rest of the year, the district depends on the levee system to provide flood protection. The IB&WC — a joint agency of the U.S. and Mexican governments — maintains levees on either side of the river. The present system of earthworks, built 15 years ago, has proved adequate to hold the Rio Grande within bounds. The Harlingen district maintains a 256-mile section, shown by slant-line area below, from the Gulf of Mexico to Lopeno.



Tournatractor speeds maintenance on Rio Grande levee system

In the fertile Rio Grande valley in southeast Texas, the U.S. section of the International Boundary and Water Commission is responsible for the upkeep of 256 miles of earth-levees. These levees, mostly 9′ to 12′ high (some as high as 20′), need constant attention. Their 3-to-1 slopes must be dozed on a regular schedule to insure protection against Rio Grande floods.

The general supervisor for the International Boundary and Water Commission at Harlingen, Texas, says the IB&WC finds their LeTourneau-Westinghouse tractor a valuable general maintenance machine. It works efficiently in all workable materials.

"Gets around fast"

A spokesman for the IB&WC stated: "The Tournatractor will get around fast. Its ability to go from place to place under its own power is important on these scattered maintenance jobs."

40 sec. cycle on 3-to-1 slope

In light dozing work on a typical 3-to-1 slope, Tournatractor completed 120′ push-and-return cycles in an average of 40 sec. each — 20 sec. forward and 20 to return and reposition for the next pass. The dozing distance was 60′ — 20′ on level ground and 40′ on slope.

Moves fast in emergencies

The commission depends on Tournatractor's speed in any work emergency. After heavy rains, for example, the rubber-tired dozer hurries to the site of eroded levees or washed-out access roads at high speed. On arrival, rig efficiently performs necessary repairs, reshapes eroded slopes.

Tournatractor power, speed, and maneuverability can be put to work profitably on *your* job, too. Ask us for complete specifications and other owner-verified reports on Tournatractor operation.

Tournatractor clears sand-drifts from base of old irrigation dam. The dam, part of an older flood-control system, now obsolete, will eventually be buried under a new levee bank.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-1053-A-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA

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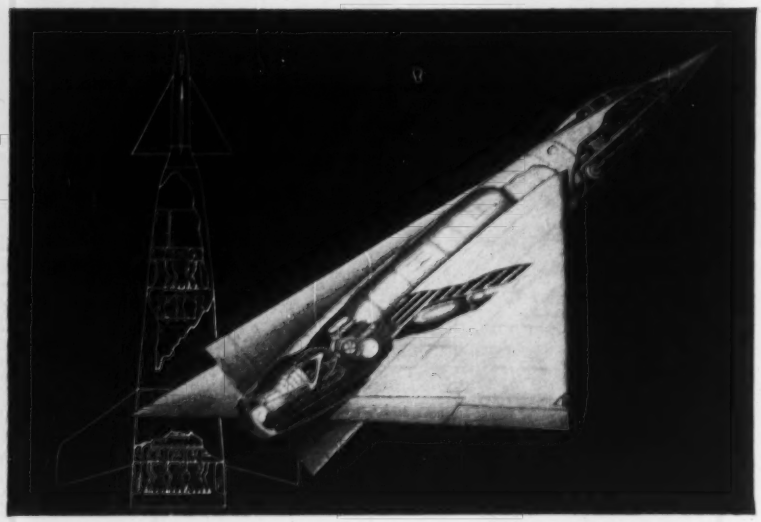
MARS outstanding design **SERIES**



3 stages to space

The designs that will make news tomorrow are still in the "bright idea" stage today—or perhaps projects under development like this three-stage, two-man space ship. Drawn by Fred L. Wolff for Martin Caidin's "Worlds in Space," the rocket craft would start out as shown in the reverse drawing at left, shed its propulsion boosters in two stages as fuel is exhausted, and end up as the trim plane-like ship at right. Ship is planned to orbit a hundred miles above earth, return safely after one to two days.

No one knows what ideas will flower into reality. But it will be important in the future, as it is now, to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and — last but not least — the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.

The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom colored *drafting* pencil, 24 colors.

J.S. STAEDTLER, INC.
HACKENSACK, NEW JERSEY

at all good engineering and drawing material suppliers

Publications

Corrugated sewer pipe—Armco's 44-page Manual CMS-7456 presents a relatively erudite case for use of corrugated metal pipe, going into the theory of flexible versus rigid pipe in the ground and detailing the firm's complete line of sewer structures. Highlights of the pamphlet are seven pages of discharge graphs for n values between .009 and .021 and nine tables relating span, loading, cover and gage. ARMCO DRAINAGE & METAL PRODUCTS, INC., MIDDLETON, OHIO.

Paper forms—Waffle-slab construction with corrugated paperboard forms is treated in a new eight-page brochure. Solid and waffle slabs are compared with respect to steel and concrete quantities required for a number of span-load combinations. A waffle-slab design is worked out in a three-page example. CONTAINER CORP. OF AMERICA, 38 S. DEARBORN ST., CHICAGO, ILL.

Metal shoring—Spanall adjustable-length metal shoring is described in an 8-page catalog, illustrated with drawings and photos. Charts show the most economical combinations of sections for various span lengths and the interrelations of slab thickness, weight, span and support spacing. SPANALL OF THE AMERICAS, INC., 787 UNITED NATIONS PLAZA, NEW YORK 17, N. Y.

Wood structural designs—The 1957 edition of "Typical Lumber Designs" lists and illustrates nearly 300 wood designs, more than 200 of which are available free. Among the structures and structural elements included are roof trusses and trussed rafters, towers, farm buildings, bridges, trestles, hangars, grandstands and barrel racks. TIMBER ENGINEERING CO., 1319 18TH ST., N.W., WASHINGTON 6, D. C.

Polyethylene foam—A new catalog sheet details the properties of Agilene-F, an expanded form of polyethylene made for low-temperature insulation, cushioning (packaging) and other uses. Behavior characteristics given include tensile-strength, water absorption, deformation under load, and recovery—all as functions of density. AMERICAN AGILE CORP., P. O. BOX 168, BEDFORD, OHIO.

Nail-glued trusses for hip roofs can be built from instructions obtainable for 25¢ from the Small Homes Council, Mumford House, University of Illinois, Urbana, Ill. The instructions covers trusses with 3 in. 12 pitch and spans from 21 ft to 28 ft 8 in.

8-speed transmission pays off

on Arkansas road project

Graves Brothers, of Pine Bluff, Arkansas, were awarded a subcontract to rebuild 2½ miles of gravel road on Arkansas Route 1, from Pendleton to the Arkansas River levee. The job included widening, raising, and leveling road grade, and building an approach to top of the earthfill levee.

Graves used an 8-speed Adams 550 motor grader and a crawler-drawn scraper to rebuild the roadway. Two D Tournapulls hauled dirt for the road-approach and a 6-speed motor grader spread and graded the fill.

"550" does heavy dirt work

Contractor assigned his 8-speed Adams grader to heavier work, where the machine's greater number of power-speed combinations could be best put to use. "550" rooted out brush along the roadside, cut new, wider ditches, and graded backslopes where necessary. Working with the tractor-scraper in cut areas, the grader bladed the clay-sand subsoil down to final sub-grade.

The Adam's ability to develop full-horsepower in any of the 8 forward and 4 reverse speeds allowed operator to take a full-blade cut, to grade at fastest rate practical. For each operation he had the "right" combination of power and speed . . . full power at 2.2, 3.2, and 4.6 mph. Thus, on the road-rebuilding portion of the job — where long, steady production cuts multiplied the working advantage — the Adams 8-speed transmission paid off in extra work at no extra cost.

Speeds general grading, too

The company was also ahead on lighter phases of this work. With more power-speed combinations, the Adams did all blading at fastest practical rate . . . spread fill, leveled sub-grade, shaped shoulders, spread gravel, and handled finish-grading.

W. A. Cassity, Superintendent for Graves Bros., likes the "550" and its wide speed range . . . says, "It has plenty of power, and operates easily and economically. I especially like the Adams fast reverse of 13 mph and its 25 mph road speed."

With only one good hand, Ranal Bozeman easily operates "550", 10 hours a day . . . does an outstanding job of grading.

Power-steer makes operation easier

Grader operator, Ranal Bozeman, has a special reason for liking the Adams. He works a 10-hour shift, steers and operates the "550" entirely with his right hand, since his left is missing. Operator Bozeman finds that Adams power-steer gives him excellent control of his machine and makes possible more precise blading. The mechanical-hydraulic steering system gives him the "feel" of the road — so necessary for accurate work and for safe driving on open highways and in traffic. Even with his handicap, he makes accurate blade adjustments easily with smooth-operating controls.

Get acquainted with Adams

You'll like Adams graders, too, for the same reasons that pay off for Graves Brothers. You'll find an Adams can do more hard work . . . quickly, accurately, and with minimum of operator effort. They grade more dirt . . . save you time and money on every construction job.

Why not get details on the complete Adams line: 6 models, 60 to 190 hp, including POWER-*Flow* model with torque converter. Write or phone for information. We'll be glad to arrange a demonstration.

Adams, POWER-Flow—Trademark, Tournapull—Trademark Reg. U.S. Pat. Off. AG-50-H-b-5

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

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Armed with ideas on public works teaching . . .

Gotaas Goes to Northwestern as Dean

Northwestern University at Evanston, Ill., will get a new engineering dean with some new ideas in February. He is Harold B. Gotaas, who for the past 10 years has been professor of sanitary engineering at the University of California.

Engineering at Northwestern is taught in the Northwestern Technological Institute, founded in the early 1940s with a substantial endowment fund from the late Walter P. Murphy. It is becoming one of the leading engineering schools in the heartland of the U. S.

NTI offers undergraduate curricula in civil, mechanical, electrical, industrial and chemical engineering; it also offers graduate work in those fields as well as in metallurgical engineering. Undergraduate work is on the cooperative basis. Starting with the spring or summer quarters of his sophomore year, a student alternately attends classes for a quarter and then works in industry for a quarter.

Although Ben (for Benedict) Gotaas says he is approaching the Northwestern assignment without firm plans, he sees it as a definite challenge. He sees an opportunity for continued development of NTI as a leading technical institute within the framework of a university. The interrelationship of the educational qualities of a university and the scientific and professional values of a technological institute, Gotaas believes, can contribute to the furthering of engineering education. He is convinced that the cooperative undergraduate program is excellent. And he feels that increased emphasis can be devoted to graduate level professional and scientific education.

Although anxious to encourage as many students as possible to take engineering, Professor Gotaas feels that a privately endowed school should exercise some degree of selectivity in its students. NTI, he believes, should do an outstanding job in highest quality education for a moderate number of students.

A real possibility for great development at NTI, according to Gotaas, is in the transportation field. A transportation center was recently established at Northwestern (ENR Oct. 18, p. 28). Sponsored by leaders in railroad, air transport, truck and pipeline fields, it was formed for both educational and research purposes and expects to be operating under a $1.5 million annual budget within three years. Although a separate entity from NTI, the Transportation Center and NTI to a degree will be jointly staffed.

Another area for concentration of training in the civil engineering field, which Gotaas feels has promise, is what he terms environmental control —water supply, waste disposal, air pollution. A possible addition to the present program Gotaas would like to offer is in the field of planning—area planning as opposed to economic planning. This could be integrated into the department of civil engineering or could be set up as a separate entity within NTI.

Addition of the planning field would permit NTI to make a three-pronged attack on the general field of public works. These three strong points would be transportation, environmental control and planning. Students could specialize in any one of the fields, or take work in any two or in all three.

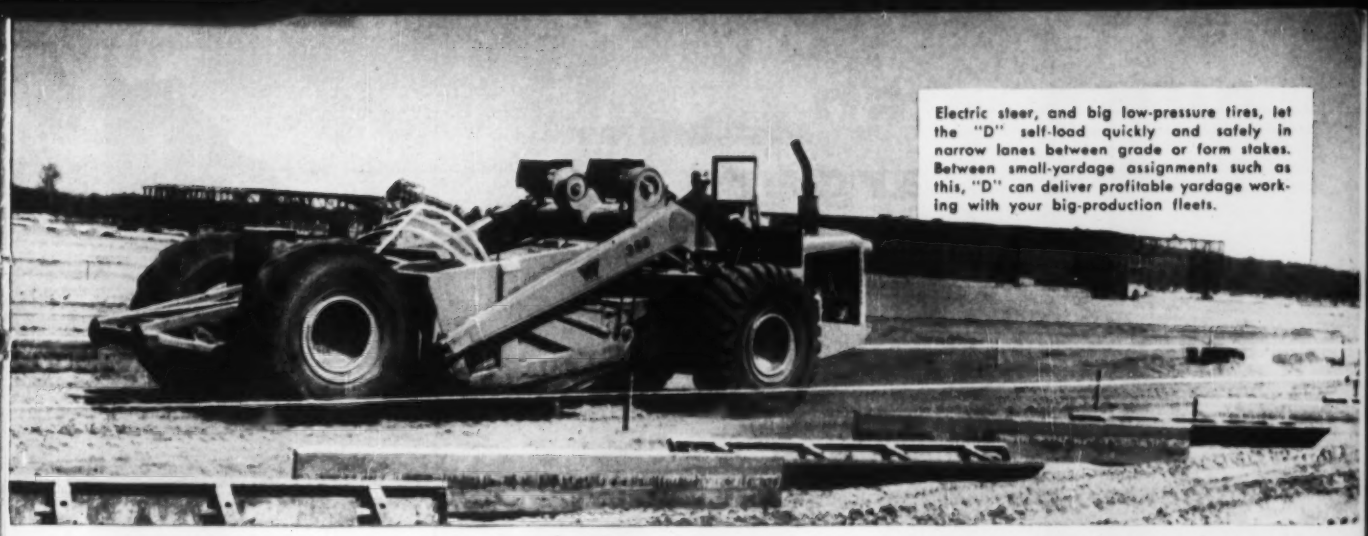
Gotaas is anxious to develop and strengthen research programs on the Chicago campus. But he is aiming at research that fits in with the educational program. Research, he says, is important where educational opportunities as well as scientific and professional knowledge can be broadened —but not as an end in itself.

Ben Gotaas will bring to Northwestern long experience at three universities—plus an unusual World War II background. A graduate of South Dakota University, Gotaas received a masters degree from Iowa State, specializing in structural engineering. Returning to South Dakota U. he served for several years on the faculty. During that time he served also as city engineer of Vermillion, S. D.

In developing the public works program of this South Dakota community, Gotaas developed an interest in sanitary engineering, which led him to Harvard in the mid-thirties to study under Prof. Gordon Fair. A masters degree was followed by a Sc.D. in sanitary engineering. From Harvard Gotaas went to the University of North Carolina where he eventually became professor of sanitary engineering.

Entering the Army in 1942, he was assigned as chief engineer of the Institute of Inter-American Affairs at Washington, D. C. He later became director of the Health and Sanitation Division and in the spring of 1945 became president of the Institute. In this work he directed a broad cooperative program for improving the capability of Central and South American countries to participate in the war effort.

After the war, Gotaas went to the University of California as professor of sanitary engineering. During his stay in Berkeley, he served for five years as chairman of the Department of Civil Engineering. He also served as director of the University of California Sanitary Engineering Laboratory. And, as a matter of fact, he plans on continuing to participate in some of the research projects that are under way there—at least until current study phases are completed.



Electric steer, and big low-pressure tires, let the "D" self-load quickly and safely in narrow lanes between grade or form stakes. Between small-yardage assignments such as this, "D" can deliver profitable yardage working with your big-production fleets.

for big jobs . . .

little jobs . . .

scattered jobs . . .

clean-up jobs . . .

finishing jobs . . .

When Winkelman-Tompkins-Jones, of Plattsburgh, New York (working on a joint venture contract) built runways for the Plattsburgh Air Force Base in New York State, blow-sand left imperfections in the grade between forms. One D Tournapull was sent in to repair the damage before final paving was begun. The "D" quickly removed the blow-sand and leveled the grade where it was uneven. One man, and one machine, did this quickly, sparing work crews for other duties.

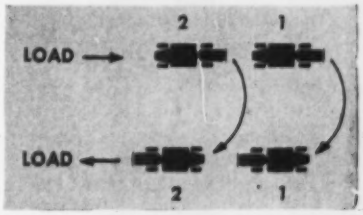
On hundreds of other earthmoving operations, the improved "handyman" D Tournapull can handle a wide variety of job assignments. It hauls fill, levels sub-grades, slopes shoulders, cuts drainage ditches, fills washouts, levels land for building sites, handles clean-up on construction projects . . . all at low cost with only a one-man crew.

Works alone, or in fleets

This rubber-tired hauler fills the need for a fast, flexible self-propelled scraper to handle both large and small yardage assignments . . . on long and short hauls.

With its 9-cubic yard heaped capacity, D Tournapull is large enough and fast enough for profitable use in pusher fleets . . . yet small enough for economical one-man operation where self-loading is a desirable advantage. It works easily in tight quarters and around obstructions, making 180° turns in 26', two feet less than its overall length. Only 8 feet wide, for road clearance, and axle-loads within allowable 9-ton limit, D 'Pull can be roaded without special permit.

Used in pairs, D Tournapulls help push-load one another . . . eliminate need for tractor or grader pushers. For example, scraper #2 first loads scraper #1 . . . then #1 turns, assists #2



Travels job-to-job fast

Not only is the "D" highly versatile, it *runs* from one worksite to the next . . . over highways or cross-country, over curbs and railroad tracks, at speeds to 29.5 mph.

You don't need a truck-and-trailer to haul D Tournapull to its assignments. You eliminate all loading and unloading delays. And on production earthmoving, the "D" works fast . . . moves more earth in less time than big crawler-tractor-scraper combinations costing thousands of dollars more.

Ask for owner-verified reports of actual performance records. Tournapull's advantages can help you make more profits on a wider variety of jobs. Let us give you details and arrange a demonstration.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-943-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

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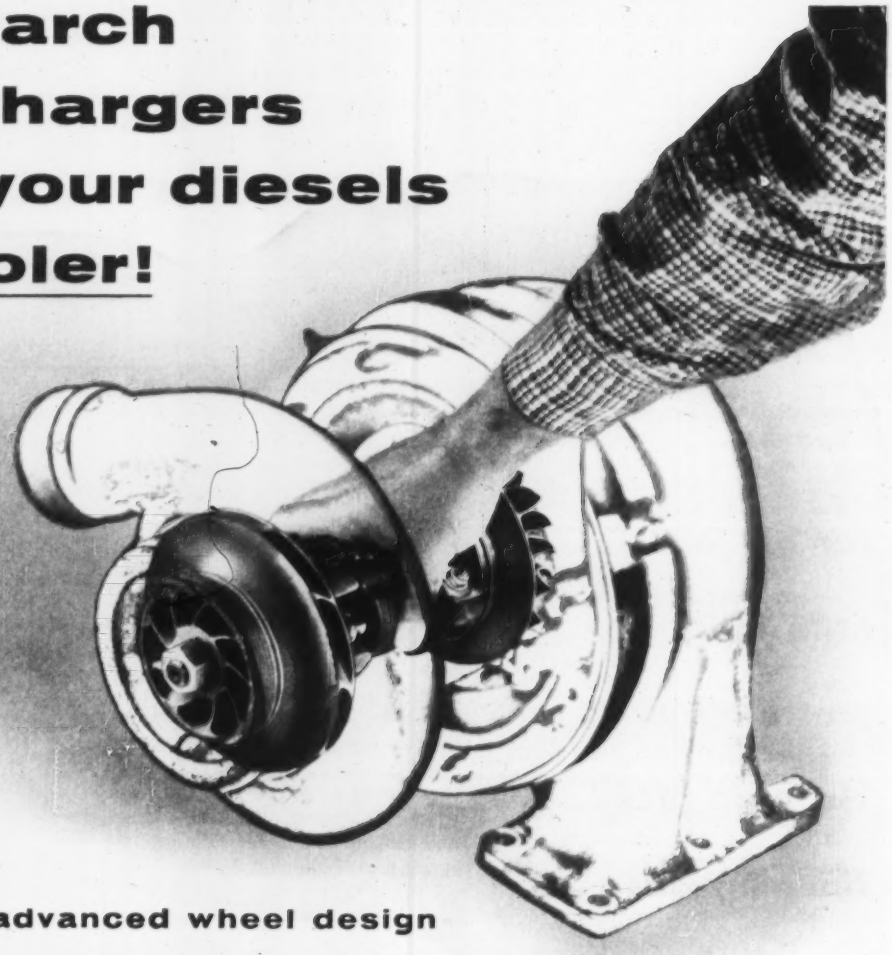
ARBA See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

AiResearch Turbochargers make your diesels run cooler!



Factors like advanced wheel design and perfectly matched turbine and compressor keep engine thermal loading at a minimum

So effective is the AiResearch turbocharger that it provides power gains while actually lowering the heat level of the engine.

Ambient air is compressed with an efficiency as high as 82%, feeding a maximum weight of air into the cylinders at the lowest possible temperature.

Results: maximum power gain at minimum fuel cost; complete combustion with elimination of objectionable smoking; low engine thermal loading insuring long, trouble-free operation.

All AiResearch turbochargers are air cooled, placing no added burden on the diesel cooling system and requiring no complicated plumbing. The rotating assembly is removable as a unit, simplifying in-the-field maintenance. This advanced design evolved from the most extensive experience in the field of small turbomachinery in America.

Your inquiries are invited.

BASIC SPECIFICATIONS FOR AIRESEARCH TURBOCHARGERS

MODEL	T-10	T-14	T-15	T-30-2	T-30-6
Diameter — in. nom.	9	11.5	15.25	15.25	16
Length — in.	9	14.12	16.75	17.25	21.75
Weight — lb.	40	95	125	135	195
Output — lb/min. (Standard Conditions)	25-40	35-65	35-65	70-95	115-175

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

LOU R. CRANDALL, new board chairman

RAYMOND C. DALY, new president

Top Management Changes Made by Fuller

Heading a list of high-level changes announced by the George A. Fuller Co. last week, Lou R. Crandall, president since 1928, succeeded Edwin J. Beinecke as board chairman of the New York City contracting firm. Raymond C. Daly, vice president since 1953, moved into Crandall's old job as chief executive.

Crandall has been with the 75-year-old company since 1917, when he left the University of Michigan with a master's degree in civil engineering. since then, his alma mater has honored him with a doctorate.

One of the high spots in Crandall's career was heading the Fuller-Turner-Walsh-Slattery team that built the United Nations Building in New York after World War II.

During the war, he played an important personal role in development of the Quonset hut.

Under Crandall's leadership, Fuller has built such postwar landmarks in New York City as Lever House and the Manufacturer's Trust Co. branch at Fifth Ave. and 43d St. Currently the firm is building the first bronze-clad skyscraper, the House of Seagram, and has general contracts for Astor Plaza and the newly-announced Time and Life Building.

Daly, also a Fuller veteran and a University of Michigan alumnus, joined the company in 1930.

He holds a bachelor's degree in civil engineering.

Edwin J. Beinecke, the retiring board chairman, will remain a director of the firm. Walter Beinecke, Jr., was elected to fill the board vacancy created by the resignation of Walter Beinecke, Sr.

A. N. Carter Leaves AGC To Join Consulting Firm

Archie N. Carter, for the last nine years manager of the Highway Division of Associated General Contractors, has joined James A. Lindsey, Jr., consulting engineer of Excelsior, Minn., to form the new firm of Lindsey, Carter & Associates, Inc., in the Minneapolis suburb.

The new firm will expand the engineering services of Lindsey Engineering Co., which James Lindsey has headed as president for the last three years, specializing in the planning and design of highways, drainage, water supply, sewerage and other municipal facilities, plus land surveying.

Carter received his civil engineering degree from the University of Iowa. Following two years service with the U. S. Army Engineers, he worked in Liberia, West Africa, building highways on the Firestone plantations. Upon returning to this country, he joined the editorial staff of ENGINEERING NEWS-RECORD, leaving after nine years to become manager of the AGC highway contractors' division.

Lindsey, a civil engineering graduate of the University of Minnesota in 1939, has worked with the Minnesota State Highway Department, the U. S. Bureau of Reclamation, the U. S. Navy, the consulting firm of Hitchcock & Estabrook, Inc., and for the U. S. Fish and Wildlife Service.

Corps Moves Generals: Holle, Wilson and Brown

Three Corps of Engineers generals have moved up into new posts in Washington, D. C.

A newly created post of special assistant to the chief of engineers has been filled by Maj. Gen. Charles G. Holle, who has been deputy chief of engineers for construction since June, 1955. In his new position, General Holle will serve as permanent chairman of the Board of the Engineers for Rivers and Harbors; alternate to the Secretary of the Army on the St. Lawrence River joint board of engineers, and representative of the chief of engineers, Maj. Gen. E. C. Itschner, on matters relating to the St. Lawrence Seaway.

Brig. Gen. Walter K. Wilson, Jr., assistant chief of engineers for military construction since May, 1956, moves up to General Holle's old post.

Taking over General Wilson's vacated position will be Brig. Gen. Edward A. Brown, Jr., who has been acting deputy chief of public information and deputy chief of information and education, Department of the Army, since August, 1955.

Men and Jobs Briefs . . .

Associations—The American Institute of Mining, Metallurgical and Petroleum Engineers elected as president Dr. **Augustus B. Kinzel,** vice president of Union Carbide and Carbon Co. . . . **Fred F. Loy,** district engineer of the Portland Cement Association has been elected president of the Iowa section of the ASCE. . . . **John H. Stewart,** president of Stark Ceramics, Inc., Canton, Ohio, elected president of Structural Clay Products Institute. . . . **Walter M. Leuthold,** board chairman of Deer Park Pine Industries, Deer Park, Wash., is elected president of the National Lumber Manufacturers Association. . . . **Lucien E. D. Gaudreau,** of the architectural firm of Gaudreau & Gaudreau, is elected president of the Building Congress and Exchange of Baltimore. . . . **C. W. Mangle,** chief engineer for William C. Olsen Consulting Engineers, is elected president of the North Carolina section of the American Water Works Association.

FOR REMOTE CONTROL JOBS on a great variety of CONSTRUCTION EQUIPMENT

TRU-LAY *Flexible* PUSH-PULLS

• Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers, etc.

On construction equipment these dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and on many other applications.

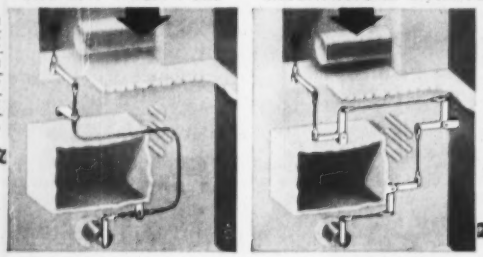
TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances up to 150 feet or more.

• • •

For complete information and details, write for DATA FILE.

"**Solid as a rod but *flexible* as a wire rope**" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below—



TRU-LAY *flexible* PUSH-PULLS are dependable and accurate even under the most adverse conditions. They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls means the virtual elimination of maintenance.

Our DATA FILE will answer your further questions
Write for a copy without obligation

ACCO

AUTOMOTIVE and AIRCRAFT DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

601-F Stephenson Bldg., Detroit 2
2216-F South Garfield Ave., Los Angeles 22 • 929-F Connecticut Ave., Bridgeport 2, Conn.

Obituaries

G. R. Allison, 64, retired civil engineer, died in New Castle, Ky., on Dec 12. A former county road engineer, he had served as an engineer at Fort Knox from 1948 until his retirement in 1954.

John W. Hudson, 50, former engineer for the Kentucky State Highway Department, died Dec. 12 in Louisville. At the time of his death he was employed as a civil engineer for Hubbard E. Rudy & Co. of Louisville.

George S. Ward, retired civil engineer, died recently in Georgetown, S. C. Ward was formerly with the South Carolina State Highway Department and later served as construction engineer for the city of Winston-Salem, N. C.

Day Okes, 73, retired partner of Okes Construction Co. died in St. Paul Dec. 5. He had been in construction since his graduation from the University of Minnesota college of engineering in 1908. During World War I he was a major in the Corps of Engineers and during World War II engaged in highway and heavy construction defense work in Panama and on the Alcan Highway.

Earle S. Hoyt, 62, sanitary engineer in the Ohio Health Department, died Dec. 11. He served with the Third Army Engineers in World War I, and was with the health department for more than 20 years.

Francis T. Cutts, 76, St. Louis consulting engineer, died Dec. 12. A 1902 graduate of Washington University, he joined the St. Louis water division in 1904 and several years later became assistant water commissioner. In 1925 he formed the Missouri Engineering & Contracting Co., and after dissolution of the company in 1942, he became a consulting engineer.

Benjamin R. Davis, 78, former chief engineer of the Boston Metropolitan District Commission, park division, died at Winchester, Mass. Dec. 1. Since his retirement from the commission, after 50 years of service, Davis had been a consultant with the Boston engineering firm of Lewis E. Moore.

John W. Stang, Sr., 56, president of John W. Stang Corp., specialists in wellpoint installations and other phases of dewatering problems, died Dec. 1. Before forming his firm, he pioneered and sold heavy duty construction equipment.

Unit Prices

Beam Plate and Girder Bridge Over Mississippi River

This nine-span crossing takes Highway 240 over the Mississippi River, Main Street at Clearwater and Great Northern Railroad between Wright and Sherburne Counties, Minnesota. Work includes channel change excavation and grubbing of an island. Minnesota Highway Department awarded the $1,171,905 contract to Walter D. Giertsen Co. of Minneapolis, Minn., at 4.5% below the second low bid and 0.2% below the engineer's estimate. Harry Buckmaster, St. Cloud, Minn., is consulting engineer.

The total length of 1,104 ft consists of 76-84-84-112-ft beam spans, one plate girder span of 132 ft and four of 150 ft. The roadway is 30 ft wide.

The contractor will use ready mix concrete from St. Cloud.

Structural and reinforcing steel, piles and lighting are furnished under separate contracts.

Wage rates are $2.10 for skilled labor, $1.80 for semi-skilled and $1.70 for unskilled labor.

1C	Walter D. Giertsen Co., Minneapolis, Minn.	$1,171,905
2	Industrial Constr. Co., Minneapolis, Minn.	1,226,729
9	Kraus-Anderson of St. Paul Co., St. Paul, Minn.	1,476,976
EE	Harry Buckmaster, St. Cloud, Minn.	1,174,493

Bids: 9-7-56

Items	Unit	Quantity	Unit Prices 1C	2
Exc, cl DE	cy	714	$5 00	$4 55
cl WE	cy	2,290	25 00	20 30
special ditch	cy	315,500	0 50	0 63
Concrete mix No. 1A6	cy	2,032 4	65 00	49 60
No. 3Y6	cy	1,624 4	65 00	71 60
No. 1B8	cy	400	65 00	42 00
No. 1X1	cy	672	65 00	33 50
Reinforcement bars	lb	454,824	0 14	0 153
Steel structural	lb	1,723,265	0 215	0 243
phosphorous chromium	lb	147,550	0 26	0 28
Std name plates	unit	2	25 00	37 00
Bearing, assemb expans, Type I	unit	4	750 00	823 00
Type II	unit	12	850 00	1,022
Ornament met rails	lf	2,219	9 50	11 35
Piles, timber				
untreat deliver	lf	27,020	2 20	2 00
drive	lf	26,248	0 30	0 38
treat, deliver	lf	4,000	2 25	2 10
drive	lf	3,768	0 35	0 38
conc, cip, deliver	lf	2,590	5 25	6 20
drive	lf	2,562	1 00	0 50
Test piles, timber				
untreat, 80' long, ip	ea	10	350 00	349 00
treat 60' long, ip	ea	2	250 00	306 00
40' long, ip	ea	4	200 00	250 00
30' long, ip	ea	2	175 00	231 00
conc, cip, 100' long	ea	2	800 00	1,027
3PI y joint waterproofing	lf	40	2 80	2 40
Flagstone, slope prot	sy	180	9 00	13 10
Elec lighting sys	ea	job	15,000	16,111
Approach curb, timber	ea	4	75 00	72 50
Riprap, hand placed	cy	40	9 00	12 50
Bear assemb fixed, type I	unit	4	325 00	470 00
type II	unit	4	400 00	580 00
type III	unit	8	400 00	500 00
type IV	unit	8	650 00	710 00
Shoulder drains, met, f&l	ea	2	120 00	154 00
Pipe flumes, met 12" f&l	lf	190	4 00	4 50
Conc erosion control struct.	cy	0 74	300 00	242 00
Clearing	ac	1	400 00	400 00
trees	ea	10	10 00	20 00
Grubbing	ac	1	400 00	250 00
trees	ea	10	10 00	20 00
Old struct, remov	ls	job	1,000	6,636
Riprap, random	cy	1,202	5 50	8 50

Work to start: 6 1 57 To be completed: 2 1 59
Liquidated damages: $20.00 per calendar day

Milwaukee Water Main Includes Tunnel Section

In this $383,535 water line to supply the southwest of Milwaukee, Wisconsin, the city integrates for the first time concrete water pipe with existing cast iron mains. E. A. Schmidt is city engineer.

W. J. Lazynski, Inc., Milwaukee, took the contract at a price of 1.75% above the engineer's estimate but 1.7% below the second low of four bids.

The 476-lin ft tunnel, 120 in. in diameter, of steel liner plate and reinforced concrete, carries the water main under a railroad storage yard and the main line service.

The contract calls for 4,800 lin ft of water main with valves and manholes. Approximately 1,400 lin ft will be installed in old rubble fill. The major portion of the main is plain concrete pipe, 42 in. in diameter, while the rest includes 42-in. welded steel pipe and 12-in. to 36-in. cast iron pipe.

Pipe and tunnel prices reported in this table include fittings, excavation and backfill, except for the 36-in. cast iron pipe which the city will supply (for the contractor to install).

Specifications require either 18/40 or 21/45 iron for standard A21.1 pipe. Fittings must conform with AWWA CI 100-08, class C.

Wage rates are $3.05 for foremen, $2.78 for skilled labor, $2.50 for semi-skilled and $2.34 for unskilled labor.

The bidders include:

1C	W. J. Lazynski, Inc., Milwaukee, Wis.	$383,535
2	U. S. Sewer Const. Inc., Milwaukee, Wis.	390,203
4	Tomaro Contr. Co., Milwaukee, Wis.	428,315
EE	Mr. E. A. Schmidt, Milwaukee City Engineer	376,995

Bids: 11-14-56

Items	Unit	Quantity	Unit Prices 1C	2
Water main, CP, 42"	lf	4,785	$42 00	$45 90
stl pipe, 42"	lf	480	60 00	46 00
CIP, 36"	lf	53	40 00	20 00
24"	lf	141	15 00	15 00
16"	lf	50	20 00	10 00
12"	lf	31	20 00	9 00
Blow-off pipe, CI, 12"	lf	27	5 50	10 00
8"	lf	204	4 75	6 00
Valves, 36"	ea	2	65 00	60 00
16"	ea	2	120 00	30 00
12"	ea	2	25 00	30 00
8"	ea	3	20 00	25 00
24"	ea	1	45 00	40 00
Tunnel, reinf conc	lf	476	265 00	270 00
Blow-off wells	ea	2	1,700	1,100
Valve vaults	ea	1	1,500	1,900
manholes	ea	2	325 00	500 00
Blow-off manholes	ea	3	350 00	250 00
Tunnel manhole	ea	2	1,500	1,100
Pipe manhole	ea	2	275 00	600 00
Wall, conc	sf	3,624	0 50	0 50
Original service, connect	ls	job	25 00	150 00
Service pipe, lead, 1"	lf	8	5 00	12 00
CIP, 36", remove	lf	88	30 00	10 00
24", remove	lf	34	25 00	10 00
16", remove	lf	158	25 00	10 00
12", remove	lf	20	25 00	10 00
Blow-off pipe, CI, 6", remov	lf	16	10 00	10 00

Time to complete: 138 calendar days
Liquidated damages: $1,918 per day

From our
50th Anniversary Album
Photo by Buffalo Evening News
MARINE TRUST BLDG., Buffalo
Braced and underpinned 7 story printing bldg. by jacking 86 hercules pipe piles, prior to installation of Marine Trust Bldg. deep pile foundations. John W. Cowper Co., Inc., General Contractors.
Service Experience
✓PILING ✓FOUNDATIONS
✓SHORING ✓UNDERPINNING
✓CONSULTATION & DESIGN
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General Contractors for 50 Years
Inquiries are invited—no obligation.

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES

- Cement, Aggregates, Ready-mixed Concrete, Asphalt: Last, Dec 6; Next, Jan 10
- Iron and Steel Products, Pipe: Last, Dec 13; Next, Jan 17
- Wood Products, Glass, Explosives, Chemicals: Last, Dec 20; Next Jan 17
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Dec 27; Next Jan 24

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edges per Msq ft ½"	⅝"	GYPSUM BOARD LATH plain or perf per Msq ft ⅜" x 16" x 48"	GYPSUM SHEATHING tongue & groove per Msq ft ½" x 2' x 8'	FIBER BOARD SHEATHING asph impreg & coat per Msq ft ½" sq ed	¾" T&G	FIBER BOARD INSULATION sq edge, paint per Msq ft ½"	MINERAL WOOL INSULATION† loose, per 40-lb bag a	3" batts per M sf	GLASS FIBER INSULATION† loose, per 40-lb bag a	3" batts per M sf	ALUMINUM FOIL 80¢ Kraft 1 side foil per roll of 250 s. f.	Expansible Blanket 2 layers foil per Msq. ft
Atlanta	$70.00	$80.00	$43.00	$70.00	$70.00	$127.00	$77.00	$1.00	$80.00	$1.65b	$65.00	.....	.....
Baltimore	.51.25f	44.75f	32.55f	65.00f	65.00f	108.50f	69.00f	1.30	68.50	1.80	45.00	$4.00g	$33.50
Birmingham	73.00	80.00	47.77	75.00	80.00	134.00	79.00	1.40	70.00	1.80	75.00	3.13g	.....
Boston	57.00m	46.50m	33.00m	52.00m	64.00m	109.00m	79.00kn	1.45	70.00	....	60.00	6.00	58.50
Chicago	67.00	82.00	43.00	62.00	85.00	123.00	85.00	1.85	80.00	....	63/65bb	5.25r	.....
Cincinnati	46.40w	41.60w	30.80w	49.81w	67.50w	120.00w	70.00w	1.25	60.00	1.25	73.50	3.12½	50.00w
Cleveland	60.50	55.00	40.00	65.00	70.00	111.00	75.00	1.35/1.50	75.00	1.80oo	57.50oo	17.50s	50/55
Dallas	58.00	55.00	42.50	65.00	73.50	122.50	70.00	1.90	65.00	1.35	65.52	4.25	.....
Denver	62.00	54.50	41.00	62.00	75.90	126.00	74.90	.....	71.00t	1.30r	55.00	11.00r	91.00
Detroit	57.50	49.75	36.00	60.00	58.50	98.00	57.50	.....	.....	1.95bb	83.00	.....	.....
Kansas City	65.00	55.00	40.00	65.00	72.00	120.00	78.00	1.40	80.00	1.40	80.00	11.24dt	19.44
Los Angeles	64.00	60.00	0.325z	66.50	71.87	121.25	80.00	.....	82.00	1.35u	64.00	4.20g	.....
Minneapolis	60.00	70.00	0.40z	80.00	70.00	140.00	78.00	1.60	80.00	1.80	80.00	6.00	.....
Montreal	56.00	48.00	36/39	53.00	60.00	.....	63.00	1.30	56.00	1.30	56.00	18.00s	56.00
New Orleans	57.00	48.00	45.00	60.00	75.00	125.00	72.50	1.75	68.00oo	.....	.....	.....	.....
New York	53.00	45.50	35.00	54.00	69.00	109.00	70.50	1.55	65.00	1.90p	67.00	5.20	43.80ss
Philadelphia	50.00	48.00	34.00	48.50	67.50	105.00	49.20	.....	63/70	.....	70/75	5.50/6	34.50/44.50
Pittsburgh	65.00	55.00	40.00	68.00	65.00	105.00	60.00	1.90	72.00	1.90	72.00	4.10	.....
St. Louis	62.00	55.00	39.00	70.00	75.00	120.00	80.00	1.60	80.00	1.65	62.00	6.67i	.....
San Francisco	54.00c	46.00	0.35z	57.00	61.00	102.00	60.00	1.60	66.50	1.55	66.50	4.95	55.00
Seattle	66.00	57.50	46.50	65.00	74.50	125.00	73.50	1.60y	74.00	1.60aa	50.00aa	4.25g	46.50
Toronto	61.00	50.00	38.00	64.50	75.00	.....	.....	1.40	60.00	.....	60.00	16.00s	45.45

*a for hand packing *b per 30# bag *d 40# kraft paper *e 20# sq ft bag, 4" thick *f full trailer loads *g 80# kraft paper backing *h LCL *i 40 lb roll *j 80 lb roll *l flame-proof $75.00 *m 10 ton quantities *n distributor's siding *o per Msf roll *p per sf *r per cwt *s per 35# bag *t per M sq ft *w fob city *x per sq. yd. *y 25# bag *z 32# bag *aa fob warehouse *bb 2" *cc in 250 sf rolls, of 16", 20", or 24" width.

HOURLY WAGE RATES—Base rate + fringe benefits

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const
Atlanta	$3.35	$2.80	$3.05	$2.80	$3.00	$3.20	$3.20+25¢cc	$1.45	$1.45
Baltimore	3.45+10¢d	2.95+7½¢e	3.50+7½¢e	2.70/2.95+10¢d	3.25+7½¢e	3.30	3.20+7½¢e	1.80+7½¢e	1.80+7½¢e
Birmingham	3.50	2.70	3.00+7½¢h	2.52	2.92	3.175	3.17+10¢n	1.50	1.60
Boston	3.50+10¢d	3.05+10¢d	3.55+7½¢h	3.50	3.50+20¢l	3.30+12¢k	3.20+10¢d	2.30+7¢r	2.30+7¢r
Chicago	3.62½+7½¢h	3.35+10¢s	3.55+7½¢h	3.25+5¢m	3.54+23¢s	3.48+21¢f	3.37+22¢oo	2.57½+7½¢h	2.57½+7½¢h
Cincinnati	3.60	3.30	3.35+7½¢h	3.075/3.325	3.375	3.50+3¢N	3.50+9½¢z	2.35	2.25
Cleveland	3.55+10s	3.575	3.50+7½¢h	3.575	3.575	3.60	3.375+10¢z	2.825	2.75
Dallas	3.70	2.95	3.12½+7½s	3.075	3.50+7½¢h	3.12½+7½¢h	3.10+7½¢h	1.55	1.55
Denver	3.625	3.075	3.00+7½¢e	2.93	3.30+7½¢e	3.00	3.17+15¢ff	2.00	2.00
Detroit	3.53+20¢ss	3.20+29¢s	3.47½+20¢ff	3.20+20¢ooo	3.51+24¢ee	3.50+30½¢ff	3.45+14¢ff	2.45+20¢ooo	2.55+10¢o
Kansas City	3.70	2.95	3.075	3.095	3.375	3.325ff	3.40+7½¢h	2.155	2.18
Los Angeles	3.80	3.00+10¢d	3.40+10¢e	2.95+10¢d	3.75+12½¢ff	3.60	3.525+10¢d	2.30+7½¢h	2.30+7½¢h
Minneapolis	3.425	3.00	3.17	2.95	3.10+23¢oo	3.12oo	3.065+20¢oo	2.25	2.25
New Orleans	3.25+5¢s	2.725	3.10+7½¢h	2.85+7½¢h	2.87½+5¢m	3.025+7½¢h	3.15+15¢s	1.55	1.55
New York	4.25+37¢kk	3.75+30¢kk	4.15+24½¢e	4.00+32¢e	4.00+50¢ee	3.65+40¢ee	3.95+35½¢kk	2.65+21¢ff	2.65+21¢ff
Philadelphia	3.75+17¢e	3.305	3.55+18¢e/M	3.15½/3.90½+10¢e	3.65+15¢ff	3.77+15¢oo	3.75+11¢e	2.10	2.40
Pittsburgh	3.75+17½¢hh	3.40+7½¢h	3.55+10¢ee	3.35+7½¢h	3.45+17½¢ee	4.00+7½¢oo	3.425+7½¢h	2.25+7½¢ff	1.98+10¢e
St. Louis	3.75+19¢e	3.25+7½¢h	3.25+7½¢h	3.325	3.425+7½¢h	3.60+25¢e	3.55+21¢ff	2.30+7½¢h	2.30+7½¢h
San Francisco	3.75+36½¢ee	3.25½+10¢e	3.40+10¢e	2.98+10¢e	3.61+20¢oo	3.37½+23¢ff	3.45+46½¢ff	2.325+10¢e	2.325+10¢e
Seattle	3.55+10¢d	2.80+10¢d	3.07+10¢d	2.90+10¢d	3.27½+10¢e	3.20+19½¢ff	3.15+21¢ff	2.37+10¢d	2.37+10¢d
Montreal	2.10+14¢t	1.90+14¢t	2.00+14¢t	1.80+14¢t	2.12+18¢t	2.10+18¢t	2.12+18¢t	1.30+10¢t	1.30+10¢t
Toronto	2.66+10¢oo	2.45+10¢oo	2.40+10¢oo	2.55+10¢oo	2.45+18¢oo	2.65+10¢oo	2.44+10¢oo	1.50+6¢oo	1.50+6¢oo

ENR Skilled Average (Bricklayers, Carpenters, Iron workers): $3.439. **ENR Common Average** $2.204

* Cost of living bonus now included in basic wage. † 8% fringe benefits. ** 4% vacation fund. *a 8 hr. day. *b 7 hr. day. *c 3% vac. stamp fund plus 7½¢ WF for bricklayers; 4% VF for electricians plus 8¢ WF, 1% PF. *d 10¢ H&WF. *e 10¢ VF. *f 8% WF. *g 11½¢ WF. *h $2.85 homes & housing plus 7½¢ WF. *i 17¢ WF. *j 10½¢ hr. WF. *k 7½¢ hr. WF. *l 4% VF. *m 5¢ hr. WF. *n Plus 11% fringe benefits on gross wage ea. yr. *o 10¢ PF. *p 3% WF, 3% PF. *q 10¢ ins; 8% vac. and holi-day pay. *r 4% WF and 20¢ PF. *s 5% W&PF, 4% VF, 1% NC, 6 PH. *t 7½¢ H&WF. *u 11½% PF. *v 10¢ WF. *w Negotiating. *x 5¢ VP. *y 23¢ WF. *z 5¢ HP. *A 15¢ WF, 15¢ PF, 20¢ B.F. *B 7½¢ VP, 5¢ PF, 1½¢ EF. *C 15¢ WF. *D 10¢ H&WF, 5¢ organ. *E 6% WF, plus travel pay per day. *F Plus $4 per day Annuity contrib. *G 3¢ Prom. *H 7¢ WF, 6% VF. *I 15¢ H&WF, 5¢ for Advtg. *J 5% WF, 6 PH, 3% PF. *K 25¢ W & PF, 15¢ VF. *L 3% WF, 3% PF, 2% VF, 1% EF. *M 7½¢ PF. *N 1% WF. *O 10¢ W, 1% NECA. *P 10¢ hosp. ins.; 5¢ PF, 5¢ VF. *Q 1 drum, 2 drums 3.40/3.55+10¢. *R 10¢ H & WF, 2¢ admin. and 1¢ apprentice. *S 12+¢ H and WF. *T 21¢ H, W & VF. *U 7½¢ WF, 4% VF, 1% PF. *V 5% WF, 3% PF. *W 2% F. *X 12¢ VF, & 7½¢ H & WF. *Y 7¢ H & WF. *Z 9½¢ WF. *aa 7¢ WF, 15¢ PF. *bb 8¢ WF. *cc 25¢ WF. *dd 12½¢ WF, 14¢ PF, 5¢ Jt Bd, 5¢ Prom. *ee 7½¢ FB. *ff 7½¢ ins. *gg 10¢ ins.

	Truck drivers 1½ T	Truck drivers —4 cy	Truck drivers +4 cy	Tractor Operators—Incl. bulldozers 34-49 hp	Tractor Operators—Incl. bulldozers 50-100 hp	Tractor Operators—Incl. bulldozers 100 & over	Tractor scraper 15-18 cy	Power cranes & shovels ½ cy	Power cranes & shovels ¾ cy	Motor grader oper	Air comp oper	Air tool oper
Atlanta	$1.75	$	$	$2.525	$2.525	$2.525	$2.525	$3.05	$3.05	$2.525	$2.30	$1.67
Baltimore	1.60+7½¢e	1.75+7½¢e	1.85+7½¢e	2.85/3.30h	2.85/3.30h	2.85/3.30h	2.85/3.30h	3.40/3.55+10¢m	3.40/3.55+10¢m	2.85/3.30h	2.85/3.30h	2.25
Birmingham	1.60	1.79ll	2.05oo	2.66	2.66	2.66	2.80	2.80	2.80	2.76	2.385	1.75
Boston	2.195r	.....	.....	3.025d	3.025d	3.025d	3.025d	3.40	3.40	3.40	2.95	2.45+7¢r
Chicago	2.08+12½¢hrr	.....	.....	3.00+5¢s	3.15+5¢s	3.05+5¢s	2.85+5¢s	3.60+5¢s	3.60+5¢s	2.95+5¢s	2.95+5¢s	.....
Cincinnati	2.20oo	2.30oo	2.40oo	3.075	3.075	3.075	3.075	3.325	3.325	3.325	3.325	3.325
Cleveland	2.50+10¢m	2.50+10¢m	2.50+10¢m	3.325	3.325	3.325	3.325	3.575	3.575	3.325h	3.20	3.20
Dallas	1.55	1.55	1.55	1.55/2.625l	1.55/2.625l	1.55/2.625l	1.55/2.625l	1.55/2.625l	1.55/2.625l	1.55/2.00l	1.55/2.00l	1.70/2.00l
Denver	2.15	2.15	2.25	2.15	2.76	2.76	2.76	2.93	2.93	2.76	2.76	2.35
Detroit	2.45	2.45	2.45	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.30+10¢m	3.025+10¢m	2.68+20¢mm
Kansas City	2.115n	2.115r	2.19w	2.30	2.85r	2.85r	2.85r	3.095	3.095	2.71	2.85r	2.24
Los Angeles	2.405+7½¢e	2.405+7½¢e	2.435+7½¢e	3.05+10¢m	3.05+10¢m	3.05+10¢m	2.85+7½¢u	3.30+10¢m	3.30+10¢m	3.30+10¢m	2.54+10¢m	2.51+7½¢e
Minneapolis	2.25	2.25w	2.40r	2.63	2.85r	3.07r	2.85	3.07w	3.33r	2.63	2.52	2.35
New Orleans	1.70	1.95	1.95	2.20+7½¢u	2.85+7½¢u	2.85+7½¢u	2.85+7½¢u	2.85+7½¢u	2.85+7½¢u	2.85+7½¢u	2.20+7½¢u	1.65
New York	2.21oo	2.75+14¢kk	2.75+14¢kk	3.37½+27¢ee	3.37½+27¢ee	3.37½+27¢ee	3.50+28¢e	4.25+34¢h	4.25+34¢h	3.50+28¢h	3.50+28¢h	3.00+15¢m
Philadelphia	1.925/2.15+7½¢e			3.15½/3.90½+10¢m			3.15½/3.90½+10¢m		3.15½/3.90½+10¢m	3.15½/3.90½+10¢m	2.97½+10¢m	2.13½+10¢m
Pittsburgh	2.20+7½¢e	2.20+7½¢e	2.20+7½¢e	2.87½+7½¢e	3.20+7½¢e	3.27½+7½¢e	3.025+7½¢e	3.35+7½¢e	3.35+7½¢e	3.25+7½¢e	3.35+7½¢e	2.20+7½¢e
St. Louis	2.30+7½¢mm			3.325kk	3.325kk	3.325kk	3.325kk	3.325kk	3.325kk	3.325kk	2.775kk	2.775kk
San Francisco	2.32½+10¢e	2.32½+10¢e	2.465+10¢	3.095+10¢m	3.095+10¢m	3.095+10¢m	3.095+10¢m	3.425+10¢m	3.425+10¢m	3.255+10¢m	2.705+10¢m	2.425+10¢m
Seattle	2.63+7½¢mm	2.63+7½¢mdd	2.83+7½¢mm	3.00+10¢m	3.00+10¢m	3.00+10¢m	3.00+10¢m	3.36+10¢m	3.36+10¢m	3.10+10¢m	2.78+10¢m	2.52+10¢m
Montreal	1.30+10¢ll	1.30+10¢ll	1.30+10¢ll	1.73+14¢ll	1.73+14¢ll	1.73+14¢ll	1.73+14¢ll	1.99+16¢ll	1.99+16¢ll	1.73+14¢ll	1.80+15¢ll	1.60+15¢ll
Toronto	1.53+6¢rr	1.53+6¢rr	1.59+6¢rr	1.95+8¢rr	2.05+10¢rr	2.05+10¢rr	1.95+8¢rr	2.55+16¢rr	2.55+16¢rr	———	2.10+8¢rr	2.10+8¢rr

*a 8¢ hr. H & WF *b lower rates, straight time, other broken *c 2-axle; 10-wheel $2.25; Euclid $2.45 *d Intermediate *e bldg constr; highway $2.55+7¢WF *f less than 2-T *g 5% WF, 3% PF *h 4% WF, 4% PF *j plus $2 pd by employer for hosp. death benefits to family *k bldg constr; steel constr $3.475 *l higher rates are union, other taken from min wage scale approved by County Commissioners Court *m 10¢ H&WF *n flatbed *o under 10 cy *p over 10 cy *q over 50 hp *r blade grader *s single *u 7½¢ H & WF *x cat oper *y up to 3½ cy *z 3½ cy & over *aa plus W & PF *bb 3% WF, 2% PF, 11 PH *cc 4% WF & 4% PF *dd up to 5 cy *ee 5 cy & over *ff over 1½ T but not over 3 *gg up to 5 tons *hh excavating *ii 4% VP *kk 7½¢ WF included in base pay *ll 8% fringe benefits *mm 10¢ H & WF, 10¢ insurance *nn 8 cy or less; 8-16 cy $2.90; 16-25 cy $3.15 *oo Plus $2.25/wk WF *rr 12¢ WF *ss 5% WF.

MEXICO CITY PRICES

In Pesos, F.o.b. City		Nov. '56	Dec. '56
Common Wages—Building (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Common Wages—Heavy Const. (8 hr. day) (Peons)	av. per hr.	1.38	1.38
Skilled Labor Wages			
Carpenters (8 hr. day) 1 el.	av. per hr.	2.48	2.48
Bricklayers (8 hr. day) 1 el.	av. per hr.	2.48	2.48
Struct. Iron Workers (8 hr. day) Remachadores	av. per hr.	3.77	3.77
Struct. Steel, Shapes 3"-15" x 12 meters per metric ton		2100.00#	2100.00#
# fob Monterrey			
Reinf. Steel, Corr. Rods ½" x 11 meters	per ton	1965.00	1965.00
⅝" x 11 meters	per ton	1965.00	1965.00
¾" x 11 meters	per ton	1965.00	1965.00
⅞" x 11 meters	per ton	1965.00	1965.00
1" x 11 meters	per ton	1965.00	1965.00
Gravel truck load at 3½ cu. meters		Nov. '56	Dec. '56
Blue Gravel	per tr. load	70.00	75.00
Rose Gravel	per tr. load	75.00	73.00
Cement, Std. Port. (Tolteca)	per tan	230.00	240.00
Lumber			
1" Pine	per M ft.	1200.00	1200.00
1½" Pine	per M ft.	1400.00	500.00

Combined MILITARY-CIVIC CENTER Adds Permanent Health Insurance

During World War II, the Air Force built a flight base near the quiet little Georgia town of Warner Robins. Almost overnight, it became a bustling city . . . and it has continued to expand ever since. By 1950, its population had reached nearly 8,000. Today, it is estimated at 17,000, and Warner Robins is also the civic center for another 16,000 living on the adjacent military reservation. The city has settled down to steady, long-term growth.

Warner Robins is providing "health insurance" for its future with *permanent* Vitrified Clay Pipe. More than 96,000 additional feet of Clay Pipe in diameters up to 30 inches was recently installed, together with a treatment plant that can be expanded to serve a community of 30,000. Warner Robins, following the lead of many growing cities, is set for the future—with the *only* sewer pipe that *never wears out.*

Mayor: W. T. Giles.
City Engineer: C. M. Franklin.
Architects and Engineers: Vinson & Company.
Chief Engineer: R. M. Breen.
Resident Engineer: W. R. Peck.
Contractor and General Supt.: Howard T. Barry.

The Public *KNOWS* Clay Pipe Is Best

Vitrified CLAY PIPE

CLAY PIPE NEVER WEARS OUT!

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1820 N. Street, N.W., Washington 6, D.C.
206 Connally Bldg., Atlanta 3, Ga. • 100 N. LaSalle St., Rm. 2100, Chicago 2, Ill. • 703 Ninth & Hill Bldg., Los Angeles 15, Calif.
311 High Long Bldg., 5 E. Long St., Columbus 15, Ohio

C-655-4

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Suburban Excavators, Inc., 4 New Salem St., Wakefield, Mass. CA **$876,950**, Proj. I-350 (8) sect. relocation Rte. 28, Andover. Bids Nov. 20, awarded Dec. 11. CD 11/26, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Campanelli Bros. Constr. Co., Nicholas Rd., Framingham, Mass. LB **$3,252,478**, U-344 (7) hy. and bridge work Canton and Stoughton. Bids Dec. 18. CD 12/5.

▲† **Great Lakes Dredge & Dock Co.**, 17 Battery Place, New York 4, N. Y. LB **$3,424,000**, est. $1,984,000. imprv. dredging Fore River at Weymouth, CIVENG-19-016-57-54, MASSACHUSETTS. U. S. Eng., 150 Causeway St., Boston, 14, Mass. Bids Dec. 19. CD 12/4.

† **The Lane Constr. Corp.**, P. O. Drawer 911, Meriden, Conn., CA **$933,672**, est. $1,200,000. pavements, utilities, Bradley Air Force Reserve Flying Center, ENG-19-016-57-74, WINDSOR LOCKS, CONN. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Nov. 27. CD 11/30, under LB.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., New York**—SCHOOL—BA 1/18—Director, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School 22, Sheriff St. between Stanton and Houston Sts. Plans deposit $25. CD 10/17.

▲ **N. Y., Plattsburgh**—HOUSING—BA ON OR ABOUT 2/8—Base Procurement Office, Plattsburgh Air Force Base, construct and finance 1,685 family housing units, (Capehart), Plattsburgh Air Force Base, Bids No. 30-636-57-36, $28,000,000. Plans deposit $100. CD 2/8/56.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—John W. Johnson, supt., Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany, N. Y.—One bid received; rejected; over estimate. Est. **$171,000** (1 bidder) paving, drainage, curbing, fencing, lighting, traffic signals, directional signs, water supply and landscaping along 7.33 mi. sect. of Major Deegan Expressway between 138 St. and Westchester Co. line, Bronx Co.

N. Y. Chemung Contracting Corp., Elmira, N. Y., LB **$1,076,525**, Est. $1,136,000 (1 bidder) reconstr. 2.05 mi. sect. of Rte. 17E through West Elmira, starting about ½ of à mi. west Big Flats-Elmira town line near Fitch Bridge, and exten. eastward to Guinnip Ave., at Elmira west city line existing 20 and 30 ft. wide route will be widened to a width varying from 40 ft. to maximum of 68 ft. and paved with b. conc., Chemung Co.

N. Y. Union Building & Construction Corp., Passaic, N. J., LB **$7,103,967**, Est. $8,569,000 (7 bidders) constr. 7.5 mi. sect. of four-lane divided Berkshire Thruway and 5.87 mi. of access and service roads, starting about 50 ft. east of Chatham-Canan town line a ½ mi. south of East Chatham, exten. southeastward to New York-Massachusetts state line, incl. constr. grade separation structures to carry Plast Rd., Red Rock Rd., Rte. 22 and Rte. 102 over the Thruway and bridges to carry the Thruway, Red Rock Rd. and Frisbee St. over Frisbee Creek, Columbia Co.

N. Y. Johnson Drake & Piper, Inc., 86 Trinity Pl., New York, N. Y. LB **$3,836,950**, Est. $4,150,000 (4 bidders) constr. 1.41 mi. six-lane divided portion of State Thruway's Niagara Sect. from Rossier St. near the Triple interchange on outskirts of Buffalo westward to Clinton St. in Buffalo incl. 2.27 mi. of access roads, and building of three grade separation structures, Erie Co.

N. Y.—Depew Paving Co., 161 Woodlawn Ave., Depew, N. Y., LB **$427,240**, Est. $461,000 (1 bidder) reconstr. 1.38 mi. sect. of Transit Rd. (Rte. 78) from French Rd. in Depew northward to Genesee St. (Rte. 33) route will be widened to provide for two asph. concrete travel lanes in each direction separated by four ft. wide center malls, Erie Co.

N. Y.—Hendrickson Bros., Inc., 63 North Central Ave., Valley Stream, N. Y. LB **$2,823,320**, Est. $2,846,000 (1 bidder) constr. Merrick Rd. traffic interchange on Conduit Blvd. (Rte. 27) between Ocean and Lincoln Aves. on western edge of Rockville Centre, incl. will be 0.62 mi. of work on Merrick Rd. and various access ramps, two hy. grade separation structures, pedestrian bridge and one stream bridge, Nassau Co.

N. Y.—DeLillo Construction Co., Inc., 71-15 51st Ave., Woodside, L. I., LB **$1,545,617**, Est. $1,690,000 (5 bidders) reconstr. imprvs., along 2.89 mi. sect. of Middle Neck Rd. (Rte. 101) from North Hempstead Turnpike (Rte. 25A) northward toward Sands Point to Delaware Ave. route will be reconstr. to a four-lane divided concrete hy. from Rte. 25A to Wakefield Ave. from Wakefield Ave. to Beacon Hill Rd. existing road will be widened to width of 62 ft. and resurfaced with asph. concrete, between Beacon Hill Rd. and Delaware Ave. will consist of constr. a storm drain and misc. related work, Nassau Co.

N. Y.—Bero Construction Corp., 259 Delaware Ave., Buffalo, N. Y., LB **$1,194,729**, Est. $1,339,000 (2 bidders) constr. 2.51 mi. sect. of River Rd. arterial route in North Tonawanda, from just south of Robinson St. opposite Schenck St. generally north-westward to west city line, new route will have asph. con. pavement varying in width from 52 ft. to 62 ft., Niagara Co.

N. Y.—Bero Construction Corp., 259 Delaware Ave., Buffalo, N. Y., LB **$1,114,410**, est. $1,168,000 (2 bidders) constr. 3.51 mi. sect. of East-West arterial route (Rte. 3) in Fulton, starting on existing Rte. 3 about ½ mi. west of city line and cut southeastward on new location to West Broadway near the D. L. & W. R.R. crossing, following Broadway to south Eighth St. and swing northeastward on new location to rejoin Oneida St. (Rte. 3) at east city line, new route will vary in width from 24 to 64 ft., Oswego Co.

N. Y.—Del Balso Construction Corp., and **Rusciano Construction Corp.**, (joint venture) 20 Pelham Parkway, Pelham Manor, N. Y. LB **$13,572,857**, est. $13,576,000 (1 bidder) constr. 4.26 mi. six-lane divided White Plains sect. of Cross-Westchester Expressway and 10.52 mi. of access and service roads from vicinity of Hillside Ave. Rte. 119 intersection in Greenburgh generally eastward through the north side of White Plains, to Anderson Hill Rd.-Westchester Ave. intersection near Harrison-White Plains line incl. building of 22 structures ranging from 30 ft. long culverts to 19 span, 1,293 ft. long viaduct over Bronx River Parkway, Bronx River and Harlem Division of the New York Central R.R., Westchester Co. Bids Dec. 20. CD 11/26.

▲ **NEW YORK**—John W. Johnson, supt., Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,

N. Y.—Lane Construction Corp., 965 East Main St., Meriden, Conn., LB **$2,758,416**, Est. $3,138,000 (3 bidders) constr. four-lane divided west approach to Berkshire Thruway Bridge now under constr. over Hudson River south of Selkirk, totaling 3.38 mi. will start about 1 mi. south of Selkirk traffic interchange on Thruway's main New York-to-Buffalo route and extend generally southeastward to bridge site, Albany Co.

N. Y.—No bids received 12/20/56. Est. **$1,174,000** elimination of grade crossing between Porter Ave. and New York Central R.R. and State Thruway's Niagara Sect. in Buffalo, involving 2.84 mi. of which 1¾ mi. will be track relocation, Porter Ave. will be carried over railroad tracks and Thruway, Erie Co.

N. Y.—No bids received 12/20/56. Est. **$467,000.** constr. three span 340 ft. bridge and approaches to carry Rte. 36 over Genesee River on northern edge of Mt. Morris, bridge having 36 ft. wide concrete pavement flanked by sidewalks, and 24 ft. wide asph. concrete approaches, totaling 0.3 mi., Livingston Co.

N. Y.—Grandview Construction Corp., 740 Fulton Ave., Mt. Vernon, N. Y. LB **$3,904,979**, Est. $4,802,000. (8 bidders) constr. four-lane divided east approach to Berkshire Thruway Bridge over Hudson River, starting about 1,200 ft. west of Rte. 9 and extending westward to the bridge site, involving 5.25 mi., Rensselaer Co.

N. Y.—Berlanti Construction Co., Inc., 15 Oakland Ave., Harrison, N. Y., LB **$3,426,204**, Est. $3,857,000 (6 bidders) elimination of grade crossings between the New York Central R.R. and Bedford and Manville Rds. in Pleasantville, incl. relocation of 1.44 mi. railroad track, relocation of passenger station and freight house 0.15 mi. of reconstr. work on Bedford and Manville Rds., Westchester Co. Bids Dec. 20. CD 11/26.

BUILDINGS—LB & CA

▲ **Lazere Constr. Corp.**, 101 Park Ave., New York 17, N. Y. LB **$2,349,000** (7 bidders) general constr. JUNIOR HIGH SCHOOL 265, North Oxford St. between Park and Flushing Aves., BROOKLYN, N. Y. Director Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Dec. 19. CD 11/21;
Daniel J. Rice, Inc., Inc., 41-50 38 St., Long Island City, N. Y. LB **$361,700** (5 bidders) heating work. (Brooklyn, N. Y.).

▲ **Austin Co.**, 16112 Euclid Ave., Cleveland, O. CA Est. **$2,000,000.** design and construct 1 story, 600,000 sq. ft. steel, masonry MFG. PLANT, near SCOTTDALE, PA. Pittsburgh Screw & Bolt Corp., 2719 Preble Ave., Pittsburgh, Pa.

▲ **Baltimore Contractors, Inc.**, 711 S. Central Ave., Baltimore, Md. LB **$2,149,000.** general constr. **$789,000** west wing addn. CITY HOSPITAL (3 bidders) BALTIMORE, MD. City Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. Bids Dec. 19. CD 12/5;
Joseph F. Hughes & Co., Inc., 5. E. Franklin St., Baltimore, Md. LB **$2,189,500.** general constr., $585,900. west wing addn. (Baltimore, Md.).
Diller-Plank, Inc., Willow St., Lancaster Co., Pa. CA **$939,900.** concrete, street, masonry Northeast HIGH SCHOOL addns., alterations, ELKTON, MD. Cecil Co., Bd. Educ., Elkton, Md. CD 11/13, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **GEORGIA**—State Hy. Dpt., 2 Capitol Square, Atlanta,
W. L. Robinson Constr. Co., 1224 W. Rugby Ave., College Park, Ga. LB **$1,451,868.** (12 bidders) interchange and bypass 3.17 mi. 4-lane limited access paving with 3 grade separation structures and service roads, Proj. I-401-2 (1) Monroe Co. Bids Dec. 14. (Correction—Low Bidder). CD 12/19, under LB.

▲† **Hardaway Contrg. Co.**, 15 E. 11 St., Columbus, Ga. LB **$6,505,700.** constr. 692 ft. concrete gated spillway in channel of Chattahoochee River between Alabama and Georgia of the Ft. Gaines lock and dam sys., ALABAMA and GEORGIA, U. S. Eng. 2301 Grant St., Mobile 7, Ala. Bids Dec. 18. CD 12/5.

Bear Brothers Lumber Co., 39 E. Jefferson St., Montgomery, Ala. CA **$945,040.** (4 bidders), air terminal at municipal airport, MONTGOMERY, ALA. City Hall, Montgomery, Ala. CD 6/1.

BUILDINGS—LB & CA

▲ **D. S. McClanahan & Son**, Columbus, Miss. CA Est. **$1,000,000.** PLANT addn., incl. electrolytic cells, equipment, bulk storage to produce sodium chlorate, COLUMBUS, MISS. Hooker Electrochemical Co., Oldbury Div., Buffalo Ave. and 47 St., Niagara Falls, N. Y. CD 3/17/54.

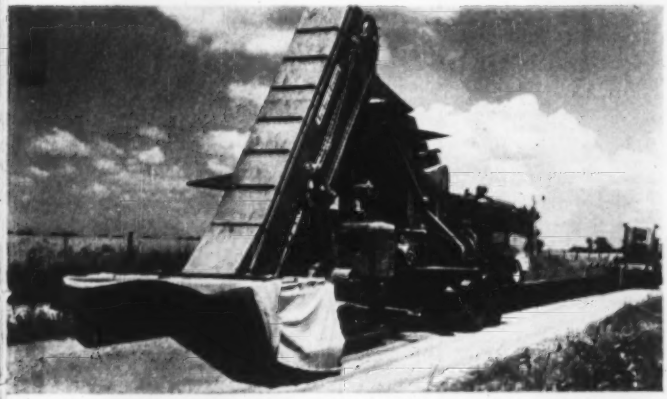
MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲† **Marine Operators, Inc.**, (Al Johnson Constr. Co., Peter Kiewit Sons Co., Cunningham Kiewit Co. and Morrison-Knudsen Co., Inc.), 608 Foshay Tower, Minneapolis, Minn. LB **$6,635,596.** Sect. 3, dredging Amherstburg Channel, lower sections, deepening channel to 27 ft. minimum, Detroit, Wayne Co., MICHIGAN. U. S. Eng., 600 E. Jefferson St., Detroit 26, Mich. Bids Dec. 14. CD 12/5;
Great Lakes Dredge & Dock Co., Williamson Bldg., Cleveland, O. LB **$6,566,040.** Sect. 4 (Michigan).

Continued on page 66

An International UD-18A powers the cyclone dust collector and a UD-1091 operates the dryer in this Barber-Greene Model 848 bituminous plant owned by Hallet Construction Company, Ames, Iowa.



Rock County, Wisconsin, is now in the paving business with this Barber-Greene Model 848 Travel plant. Towing loader uses an International UD-350 and the mixer uses a UD-18A.

100% International power units and trucks is the rule for Hazelmore Bituminous Co., Fairmont, Minn. Their Barber-Greene Model 848 continuous-mix plant is powered by a UD-18A and a UD-24.

...WHY specify International® Power Units for bituminous plants?

These owners of Barber-Greene bituminous plants and pavers would give you these hard dollar reasons: Internationals have more features that pay off in lower production costs—and unsurpassed parts and service support for your convenience.

Economical? You bet, with a clean-burning exclusive injection and combustion system...a 45° angle of injection...new open-face single-orifice nozzles that give thousands of hours of coke-free operation.

Weather-proof? Definitely, with seconds-fast all-weather gasoline-conversion starting...full-flow filtering of all fuel, lube oil and air.

Dependable? Sure thing, with such features as tocco hardened crankshaft journals, precision insert bearings and replaceable hardened sleeves.

Heavy-duty? That's the only type of engine International has built in 55 years. And the positive-type valve rotators that make valve grinding such an infrequent need is just one of the famous IH long life features that have helped sell more than 400,000 diesels.

For more information, just see your easy-to-locate International Power Unit Distributor or Dealer. He'll provide proof you can specify and get an adaptable International power unit that's exactly right for your new or used machine. So be sure of profitable power for a long time to come by specifying Internationals for all of your driven machines.

Even in Djakarta, Indonesia, the preference is for International power units. Here a UD-6 powers the government-owned Barber-Greene Model 879-A Finisher.

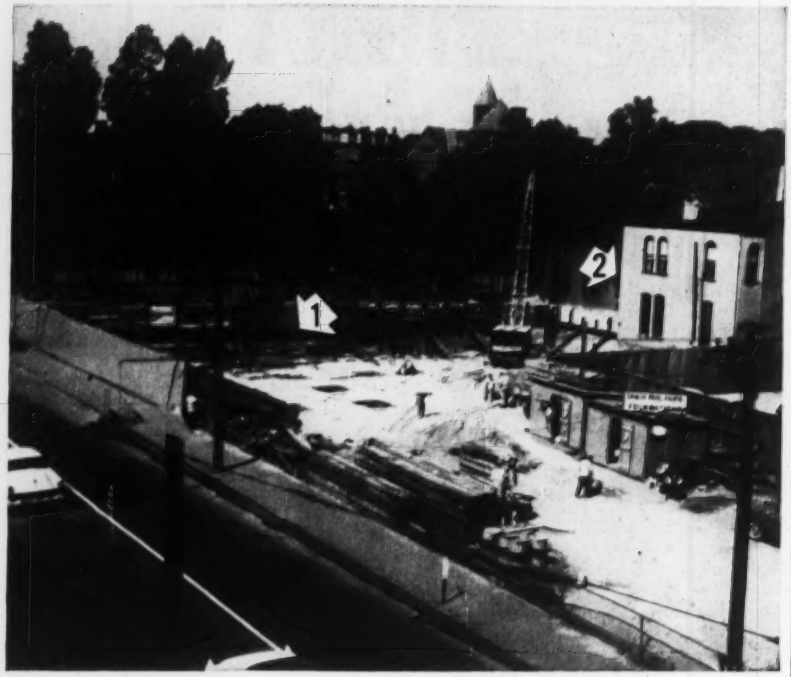
INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Side-Boom Tractors... Self-Propelled Scrapers and Bottom-Dumps... Crawler and Rubber-Tired Loaders... Off-Highway Trucks... Diesel and Carburetor Engines... Motor Trucks.

ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS

MULTI-PROBLEM JOB DEMANDS MANY SPECIALIZED SKILLS



1. Excavation is sheeted and braced.
2. Pretest cylinders underpin adjacent structures. Foundation consists of piles and open piers.

Project: New Equipment Bldg. for Southern New England Telephone Co., Bridgeport, Conn.
Architects: Davis, Cochran & Miller, New Haven, Conn.
Engineer: Henry A. Pfisterer, New Haven, Conn.

On a foundation job like this, it might well be thought that several different sub-contractors would have to be called in. Here's what had to be done.

- Excavate, sheet and brace.
- Drive 295 steel piles.
- Install open piers.
- Underpin adjacent structures with 12 Pretest cylinders.

Actually, Spencer, White & Prentis successfully performed all these operations. Wouldn't it be to your advantage too, to use this system of centralized responsibility?

You deal with a single specialist, experienced with every type of foundation problem . . . and offering all the specialized personnel and equipment to assure dependable results.

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OF CANADA: 700 BAY ST., TORONTO · 2062 ST. CATHERINE ST. WEST, MONTREAL

(Continued from page 64)

BUILDINGS—LB & CA

▲ **Freeman Constr. Co.**, R.D. 3, Wooster, O. LB **$1,525,000**. (4 bidders) HIGH SCHOOL, SALEM, O. Bd. Educ., Salem, O. Bids Dec. 19. CD 11/26.

▲ **Gerhardt Meyne Co.**, 308 W. Washington St., Chicago, Ill. CA **$1,600,000**. 1 and part 2 story, 78,500 sq. ft. Central Div. OFFICE & SERVICE BLDG., Polk and Leamington Ave., CHICAGO, ILL. Commonwealth Edison Co., 72 W. Adams St., Chicago, Ill. Shaw Metz & Dolio, 208 S. LaSalle St., Chicago, Ill., archts.

Joe Bryant, 29 N. Main St., Clawson, Mich. Owner Builds. **$800,000**. 50 brick HOMES, Hendrickson St. and vicinity, TROY, MICH.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ **Tex., Houston**—CHURCH—BA 1/10—First Christian Church, 1503 Main St., church. $1,100,000. Hamilton Brown, 2017 W. Gray St., archt. Walter P. Moore, 2 Pinedale St., and I. A. Naman & Assocs., 3305 Montrose St., engrs. CD 10/3.

▲ **Iowa, Council Bluffs**—POST OFFICE, etc.—BA 1/28—General Service Admin., 2306 E. Bannister Rd., Kansas City, Mo. post office and courthouse bldg. $1,500,000. R. C. Robinson, 310 Park Bldg., Council Bluffs, and Brooks-Borg, 815 Hubbell Bldg., Des Moines, archts. CD 11/16.

HEAVY CONSTRUCTION—LB & CA

Gjellefald Associates, Forest City, Iowa, LB **$961,433**. sanitary sewer main line and branch lines, DES MOINES, IOWA. City, City Hall, Des Moines, Iowa. Bids Dec. 3. CD 11/28.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,
Mo.—**J. A. Tobin Constr. Co.**, 3700 Rainbow Blvd., Kansas City, Kan. CA **$1,046,111**. graded earth 8.102 mi., Clay Co.;
Mo.—**Storms-Green Constr. Co. & Clark Constr. Co.**, 6601 E. 37 St., Kansas City, Mo. CA **$847,735**. graded earth 15.696 mi., Lafayette Co.; CA **$83,768**, graded earth 1.793 mi., Jackson Co.;
Mo.—**Land Constr. Co.**, 502 Seneca St., St. Joseph, Mo. CA **$258,765**. graded earth, wid'n. b. conc. 5.725 mi. Macon Co.;
Mo.—**R. Dron Electrical Co., Inc.**, 1818 Cleveland Ave., Granite City, Ill. CA **$115,212**. traffic control installation Type A, Type E, St. Louis Co. Grand total $2,351,591. Bids Dec. 5, awarded Dec. 17. CD 12/11, under LB.

▲ **NORTH DAKOTA**—State Hy. Dpt., Bismarck,
N. D.—**Alexander Constr. Co.**, 4641 Hiawatha Ave., Minneapolis, Minn., LB **$838,695**. base, b. conc. surf. 21.197 mi. Proj. F-73 (8), Williams Co.;
N. D.—**Frank E. Olson**, Williston, N. D., LB **$354,703**, tr. serv. grav. 21.377 mi. Proj. S-678 (2), Adams and Hettinger Counties. Bids Dec. 14. CD 11/28.

▲† **Bushman Constr. Co.**, 5 and Felix Sts., St. Joseph, Mo., LB $1,014,168, est. $1,034,903, earthwork and structures for Courtland Canal, Station 2472 plus 48 to 2809 plus 00; Miller Canal, Station 0 plus 00 to 456 plus 32.4, laterals, wasteways and drainage, Missouri River Basin Proj., Bostwick Div., Schedules 1, 2, 3 and 4, DC-4786, NEBRASKA and KANSAS. Bureau Reclamation, Dpt. Interior, Superior, Neb. Bids Dec. 13. CD 12/3.

BUILDINGS—LB & CA

▲ **Martin K. Eby Constr. Co.**, 610 N. Main St., Wichita, Kan., CA **$2,234,197**, ENGINEERING BUILDING, TULSA, OKLA. Douglas Aircraft Co., Inc., 2000 N. Memorial Dr., Tulsa, Okla. CD 7/19.

Southwestern States Constr. Co., 11272 Ables St., Dallas, Tex., LB **$844,900**. Sequoyah JUNIOR HIGH SCHOOL, Bickers and Greenleaf Sts., DALLAS, TEX. Dallas Independent School Dist., 3700 Ross St., Dallas, Tex. Bids Dec. 11. CD 12/3.

FAR WEST

BUILDINGS—BA

† **Idaho, Arco**—SHOP—BA 1/4—Atomic Energy Comm., Idaho Operations Office, Idaho Falls, 101x168 ft. steel frame maintenance shop on 4 concrete pier fdns. in Materials Testing Reactor area of National Reactor Testing Station, Contr. AT (10-1) 841. $200,000. CD 5/8.

HEAVY CONSTRUCTION—LB & CA

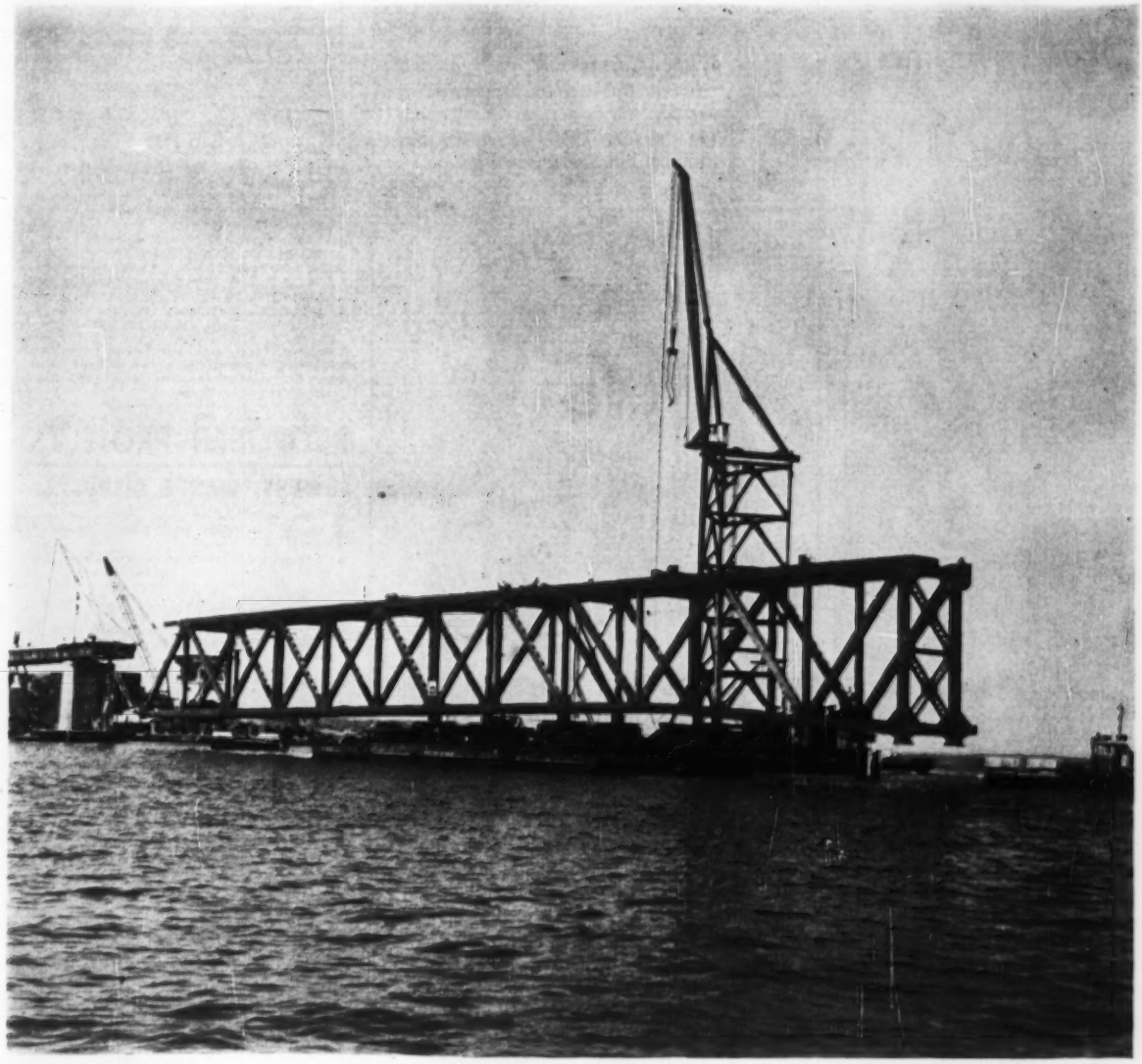
▲† **ARIZONA-UTAH**—Bureau Reclamation, Dpt. Interior, Kanab, Utah,
Kiewit Judson Pacific Murphy, 4322 East Shore Hy., Emeryville, Calif., LB **$4,139,277**, est. $2,944,750. Colorado River Bridge, Glen Canyon Dam, Colorado River State Proj. near Lees Ferry, Ariz. DC 4800. Bids Dec. 18. CD 11/2.

▲† **U. S. Eng.**, 4735 S. Marginal Way, Seattle 4, Wash., cancelled bids to be opened Dec. 28, reconstruct and extend Runway 3-21 and extending alert taxiway, Geiger Air Force Base, Inv. 57-81, SPOKANE, WASH. $1,554,035. Will readvertise. CD 11/30.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Frederickson & Watson Constr. Co., 873 81st Ave., Oakland, Calif., LB $3,685,555 (9 bidders) grading, paving 5.8 mi. four-lane divided hy., constr. 4 structures between Colfax and Magra overhead on Hy. 40, Placer Co. Bids Dec. 19. CD 11/16.

▲ **CALIFORNIA**—State Dpt. P. Wks., 1120 N St., Sacramento,
Calif.—**Cox Bros. Constr. Co.**, P. O. Box C, Stanton, Calif., CA **$682,696**, grading, surf. 3.9 mi. Lincoln

(Continued on page 68)



Modjeski & Masters, Harrisburg, Pa., are consulting engineers to the Virginia Department of Highways for design and construction of the Rappahannock River Bridge.

Floating in a big one

The truss span shown here is the first of fourteen to be floated into position on the Rappahannock River Bridge. It measures 351 ft in length and weighs 560 tons. The largest trusses to be erected by this method are the bridge's two 468-ft anchor spans which weigh 900 tons each. The 648-ft center span, largest span on the bridge, will be cantilevered out and joined at its midpoint over the main channel.

When completed, the 9,985-ft bridge will connect Grey's Point with White Stone, providing an important new link for Virginia's tidewater highway network. Design of the Rappahannock River Bridge calls for a total of fifteen truss spans and numerous beam and girder spans. The superstructure requires nearly 13,000 tons of steel, fabricated at Bethlehem's Pottstown, Pa., works.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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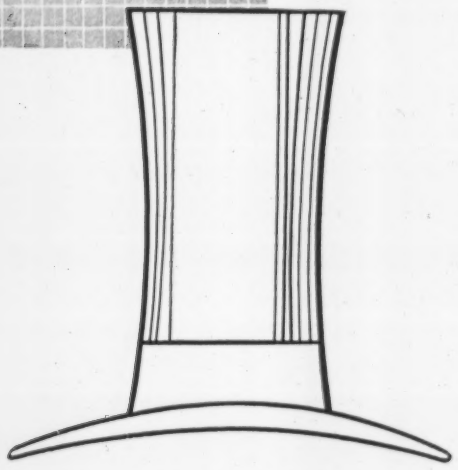
ARKWRIGHT ODDITIES

Without measuring, can you tell whether the vertical dimension of the silk hat is greater than, equal to, or less than its horizontal dimension? See answer below.



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AMERICA'S STANDARD FOR OVER 35 YEARS

(Continued from page 66)

Ave. between Los Angeles county line and Stanton Ave., Orange Co. CD 12/12, under LB;

Calif.—**Guy F. Atkinson Co.**, 10 W. Orange Ave., South San Francisco, Calif., CA $5,548,781, grading, paving 2.6 mi. Harbor Freeway between 124 St. and 88 Pl., constr. 12 bridges, 8 pedestrian crossings, pumping plant and 4 retaining walls, Los Angeles Co. Bids Dec. 6, awarded Dec. 17. CD 12/10, under LB.

BUILDINGS—LB & CA

▲ **Holmes & Narver**, 751 South Figueroa St., Los Angeles, Calif. CA $3,000,000. 2,500-3,000 bbl. per day Houdri-former at REFINERY, TACOMA, WASH. U. S. Oil & Refining Co. 221 West 23rd St., Los Angeles, Calif. CD 7/15/55.

▲ **A. V. Peterson Co.**, 2827 N. E. Glisan St., Portland, Ore., CA $1,207,748, 5 story Y.W.C.A. BUILDING, PORTLAND, ORE. Young Women's Christian Assn., 834 S. W. Broadway, Portland, Ore. Bids Nov. 13, awarded Dec. 15. CD 11/21, under LB.

▲ **Haas & Haynie-Frandsen, Inc.**, 8913 Olympic Blvd., Beverly Hills, Calif., CA $1,248,000, constr. first of four buildings for General Atomic's, a Div. of General Dynamics Corp., John Jay Hopkins LABORATORY for Pure and Applied Science, SAN DIEGO, CALIF. Convair Div., General Dynamics Corp., 3165 Pacific Hy., San Diego, Calif. CD 5/4.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Mich., Grand Rapids**—City, Mayor Paul G. Goebel, City Hall, sewerage sys., imprvs., extens. $3,000,000. CD 2/3/54.

▲ **Mich., Wyandotte**—Down River Drainage Basin, c/o William Peterson, clk., 24126 Goddard St., drainage proj., incl. sewers, east along north line, Goddard, Eureka and Pennsylvania to Fort Sts., Taylor, Etorse, Riverview, Allen Park. $6,500,000.

▲ **Okla., Tulsa**—City, City Hall, voted bonds Dec. 11, storm sewers. $3,475,000. W. R. Wooten, city engr. CD 11/15.

BRIDGES

▲ **ALABAMA and GEORGIA**—State Hy. Dpt., Montgomery, Ala., and State Hy. Dpt. Atlanta, Ga., **Houston Co., Ala. and Early Co., Ga.**—bridge over Chattahoochee River at Columbia, Ala. and Hilton, Ga. $650,000.

Russell Co., Ala., and Muskogee, Ga.—bridge over Chattahoochee River at Phenix City, Ala. and Columbus, Ga. $2,000,000.

STREETS AND ROADS

▲ **Calif., Visalia**—Tulare Co., Court House, road imprvt. program, various county roads. $2,780,000.

▲ **Mich., Grand Rapids**—City, Mayor Paul G. Goebel, City Hall, imprv. streets, incl. paving and changes for traffic benefits, $20,000,000, Raymond Bruggink, city engr. CD 11/13/44.

▲ **N. Y., Buffalo**—City, Dpt. P. Wks., street resurf. $3,300,000.

▲ **Okla., Tulsa**—City, City Hall, voted bonds Dec. 11, streets and traffic ways. $4,275,000. W. R. Wooten, city engr. CD 11/15.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg, **Perry, Juanita, Mifflin, Huntingdon, Blair, Cambria, Indiana, Westmoreland and Allegheny Counties**—imprv. U. S. Rte. 22 across Pennsylvania from Amity Hall, Perry Co. to Pittsburgh, 100 mi. of wid'n. curve elimination, bridge replacements. $78,692,861. P. A. Farley, act. ch. engr. Three-year program.

LATIN AMERICA

▲ **Brazil, Sao Jose dos Campos**—General Motors Corp., General Motors Bldg., Detroit, Mich., U.S.A., plans truck plant. $10,000,000, incl. equip.

▲ **Venezuela**—Comision de Etudios Para la Electrificacion del Caroni, Torre Sur, Piso 6, Centro Simon Bolivar, Caracas, D. F., plans 1.25 mi. concrete spillway for Macagua No. 1 hydroelectric proj. on lower Caroni River.

PUBLIC BUILDINGS

▲ **Ala., Birmingham**—SCHOOL—City Bd. Educ., 2015 7th Ave. N., voted bonds Dec. 18, public school constr. $6,000,000. CD 11/26.

▲ **Calif., Fresno**—HIGH SCHOOL—Fresno City Unified School Dist., 2314 Mariposa St., plans by Swartz & Hyberg, Lowell Bldg., McLane High School. $3,460,000. McCandless & Williams, 2016 Merced St., consult. engrs. Bids early February 1957. CD 11/9.

▲ **Calif., Long Beach**—PUBLIC SAFETY—City Council, City Hall, plans by Francis J. Heusel & Killingsworth, Brady & Smith, 703 E. 3 St., 7 story, 174,125 sq. ft. structural steel frame, public safety bldg., to house police dpt., city hall, juvenile dpt., fire dpt., etc. $3,500,000. CD 2/15.

▲ **Calif., Merced and Atwater**—HIGH SCHOOLS—Merced Union School Dist., c/o Secy., Merced, voted bonds Dec. 4, two high schools. $3,000,000. Walter Wagner & Partners, Thornington Bldg., Merced, archts. CD 11/28.

▲ **Calif., San Francisco**—HALL OF JUSTICE—City and San Francisco Co., Dpt. P. Wks., c/o Director, City

Hall, plans by Weihe, Frick & Kruse, 414 Mason St., Hall of Justice, 7th, Bryant, Harriet and Harrison Sts. $19,500,000. Hall, Pregnoff & Mather, 251 Kearny St., consult. engrs. Charles Griffith, c/o owner, city archt. CD 6/29.

▲ **Colo., Colorado Springs**—SCHOOLS—School Dist. No. 11, 406 N. Weber St., voted bonds Dec. 11, Senior High School, Junior High School, 3 new elementary schools, West Junior High School addn. $6,900,000. CD 11/9.

▲ **Conn., Norwich**—TREATMENT—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Lester J. A. Julinelle, 241 Orange St., New Haven, admission and intensive treatment bldg., Norwich State Hospital, $5,300,000. Hubbard, Lawless & Blakeley, 110 Whitney Ave., New Haven, consult. engrs. Henry W. Pfisterer, 111 Whitney Ave., New Haven, engr. CD 12/14.

Idaho, Idaho Falls—SCHOOLS—School Dist. 91 plans by N. J. Hamil & Assoc., Idaho Falls, 2 elementary schools each costing $400,000, and one elementary school, $360,000. Bids next month. CD 6/12.

▲ **Ill., Chicago**—SCHOOLS—Chicago Bd. Educ., 228 N. La Salle St., Crerar-King elementary school west side of Campbell Ave. between Polk and Lexington Sts., $1,000,000; Grant school addn., 145 S. Campbell Ave., $1,700,000; Hurley School Addn., 3849 W. 69th Pl., $475,000; Luella School Addn., 9928 Crandon Ave., $390,000; Hartigan School, 4101 Federal St., $2,030,000; new elementary school, Sedgwick and Hill St. $2,000,000.

▲ **Ind., Kokomo**—HOSPITAL—Bd. Trustees Howard County Hospital, c/o Comrs., Courthouse, plans by Daggett, Naegele & Daggett, 567 W. Westfield Blvd., Indianapolis, 105 bed hospital. $2,000,000. CD 3/1.

▲ **Mich., Grand Rapids**—CIVIC CENTER—City, Mayor Paul G. Goebel, City Hall, civic center, constr. municipal group. $10,000,000. Raymond Bruggink, city engr.

▲ **Mich., Hazel Park**—SCHOOL—City, Bd. Educ., 22750 Highland St., voted $5,500,000 bonds Dec. 12, school program, Jahr-Anderson Assoc., Inc., 15011 Michigan Ave., Dearborn, archt. CD 10/24.

▲ **Minn., Faribault**—SCHOOL—Bd. Educ., C. E. Sommer, clk., Senior High School and McKnight Elementary School. $2,000,000. CD 11/14/51.

▲ **Mo., Columbia**—LIBRARY, etc.—Curators of University of Missouri, Dale O. Bowling, bus. mgr., 116 Jesse Hall, Columbia, plans by Jamieson, Spearl, Hammond & Grolock, 1696 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, library addn., $3,500,000. Bids in 1958; plans by Gentry & Voskamp, 4 W. 13 St., Kansas City, Mo., agricultural bldg. addn., $2,100,000. Bids early summer 1957; plans by Hellmuth, Obata & Kassabaum, 315 N. 10 St., St. Louis, Zone 1, Fine Arts, $1,800,000, Bids early summer 1957; plans by Neville, Sharp & Simon, 12 and Walnut Sts., Kansas City, Mo., School of Engineering, $1,800,000, Bids early summer 1957; plans by Marshall & Brown, 1016 Baltimore Ave., Kansas City 5, Mo., Business and Public Administration School, $1,800,000, Bids early summer 1957. CD 2/1.

▲ **N. J., Livingston**—SCHOOL—Bd. Educ., Twp. of Livingston, plans by Frederick Elasasser, 2013 Morris Ave., Union, Junior High School to adjoin the new Mt. Pleasant Elementary School. $2,500,000.

▲ **N. J., Morristown**—HOSPITAL—Bd. Trustees Morristown Memorial Hospital, Madison Ave., plans by Ferrenz & Taylor, 152 W. 42nd St., New York, N. Y., and Stanley E. Richardson, 22 Mount Airy Rd., Bernardsville, 9 story hospital addn., Madison Ave. $3,000,000. CD 12/11.

▲ **N. J., Vineland**—SCHOOL—Vineland Bd. Educ., plans by Ralph E. Hacker, New Milford, high school. $3,500,000. CD 9/24.

▲ **N. Y., Buffalo**—SCHOOLS—Bd. Educ., City Hall, Junior High School adjacent to Kensington Housing Proj., $2,200,000; Junior High School, $2,400,000; Junior High School for Humboldt Park, $1,106,000; Grover Cleveland High School addn., $900,000; reconstr. of schools, $1,200,000. CD 12/27/55.

▲ **N. Y., Massapequa**—SCHOOL—Bd. Educ., Union Free School Dist. No. 23, 2 story Junior High School, Roosevelt Ave. and Spruce St. $3,450,000. Voted by referendum on Dec. 1. CD 6/1.

▲† **Okla., Muskogee**—PLANT—Gallery Chemical Co., Sub. Mine Safety Appliance Co., 230 N. Braddock St., Pittsburgh 8, Pa., plant to produce high energy fuel for rocket and aircraft propulsion near here. $38,000,000. Navy Department will finance.

▲ **Pa., Aliquippa**—SCHOOL—School Dist. of Aliquippa, plans by Michael Baker Jr. & Jos. Bontempo Assocs., 115 Shields St., Rochester, Junior High School, $2,000,000.

▲ **Pa., Canonsburg**—INSTITUTION—General State Auth., 18 and Herr Sts., Harrisburg, plans by Celli-Flynn, 335 Shaw Ave., McKeesport, 30 institutional cottages for child mental patients, administration, medical, maintenance and utility structures, $6,000,000. A. F. Jones, ch. engr.

▲ **Pa., Phila.**—INSTITUTION—General State Auth., 18 and Herr Sts., Harrisburg, plans by Vincent G. Kling, 917 Corinthian Ave., Phila., constr. institution for child mental patients, adjacent to Phila. State Hospital. $6,160,000. A. F. Jones, ch. engr. CD 2/10/47.

▲ **Pa., White Haven**—INSTITUTION—General State Auth., 18 and Herr Sts., Harrisburg, plans by Lyle F. Boulware, Fidelity Trust Bldg., Phila., institution incl. 13 mental patients' bldgs., administration, medical, maintenance and utility structures. $6,000,000. A. F. Jones, ch. engr.

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Out on the California coast, "Research House for '56" is taking shape. It's an experimental house sponsored by Associated Architectural Publications and the latest tools are being used to build it—such as the Remington Stud Driver.

Contractor Bert Pickney says, "The Stud Driver cuts time and labor costs around 75% in anchoring beam supports, partition sills and furring to concrete. It took us only half a day to install the sills—a 2-day job with bolts. No pre-drilling and sills set tight! I certainly recommend the Stud Driver to any contractor!"

YOU CAN SPEED ALL STUD FASTENINGS—light, medium and heavy-duty—with the Remington Stud Driver. It sets *both* ¼" and ⅜" diameter studs in steel or concrete—up to 6 studs a minute either size. The tool is cartridge-powered, portable, ready to work *anywhere*. Forty styles and lengths of Remington Studs to choose from. Get full details by mailing coupon.

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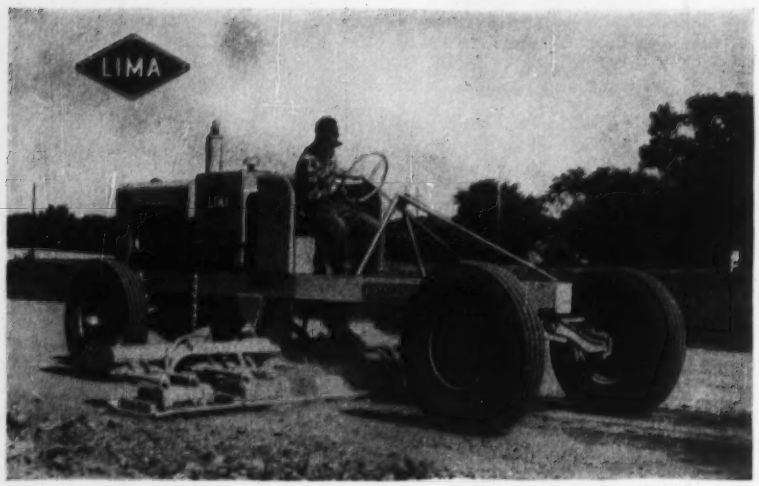
*City*_____ *State*_____



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The penetrating vibration of six heavy vibrating shoes compacts macadam bases and gravel sub-bases to specified densities.

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▲ **Va., Arlington**—COURT HOUSE—Arlington Co., Court House, plans by John M. Walton Assoc., 2049 N. 15 St., county court house, new 6 story center wing and addnl. 3rd story to existing bldg. **$2,200,000.** CD 6/7.

▲ **Wash., Seattle**—LIBRARY—City, County-City Bldg., plans by Jones & Bindon, Hoge Bldg., and Decker, Christenson & Kitchin, 1411 4th Ave. Bldg., central library. **$8,000,000.** CD 3/22.

COMMERCIAL BUILDINGS

▲ **Calif., Fresno**—MOTEL, etc.—Joseph F. Dolin & B. M. Olden, 2305 Santa Monica Blvd., Santa Monica, plans by Richard L. Darman & Assocs., 221 N. Robertson Blvd., Beverly Hills, 239 unit motel, incl. swimming pools, etc. **$2,000,000.** Bids soon, constr. in January.

▲ **Calif., Sacramento**—HOTEL—Alexander Western Development Co., 526 N. San Joaquin St., Stockton, hotel, parking garage, swimming pools, at Capitol Mall. **$10,000,000.**

▲ **Calif., San Francisco**—HISTORICAL CENTER—Maritime Museum Assn., c/o Director, foot of Polk St., plans by Campbell & Wong, 737 Beach St., constr. historical center, incl. railroad transportation bldg., ship exhibits, remodel 3 warehouses to be utilized at exhibition bldgs. at Maritime Museum, foot of Polk St. **$10,000,000.**

▲ **Colo., Denver**—HOSPITAL—St. Anthony's Hospital, W. 16 Ave. and Quitman St., plans by C. I. Monnot, 3013½ Classen Bldg., Oklahoma City, Okla., 5 story hospital addn. **$3,000,000.** CD 3/26.

▲ **Conn., New Haven**—UNIVERSITY—Yale University, 105 Wall St., plans by Douglas Orr, 111 Whitney Ave., New Haven and Eero Saarinen, W. Long Lake St., Bloomfield Hills, Mich., residential college, **$1,000,000;** residential college, **$1,000,000;** enlarge Peabody Museum, **$6,280,000.** CD 6/26.

▲ **Conn., Shelton**—HOUSES—Chamberlain Realty Co., Ripton Rd., 400 houses, Huntington Ave., White Hills. **$4,000,000.**

▲ **Del., Wilmington**—APARTMENT—J. Frank Dorling, 7th St. and Greenhill Ave., 15 story, bsmnt. 60x250 ft. brick, concrete, steel apartment. 1300 Delaware Ave. **$1,000,000.**

▲ **D. C., Wash.**—SERVICE—National Education Assoc., 1201 16th St. N.W., plans by Joseph Saunders, 1757 K St. N.W., service bldg. **$1,800,000.**

▲ **D. C., Wash.**—VISITORS CENTER—Visitors Center, Inc., c/o Walton & Maddon, archts., 3510 Rhode Island Ave., Mt. Rainier, Md., visitors center in downtown area. **$3,000,000.** Bids in May.

▲ **Ill., East St. Louis**—HOSPITAL—Christian Welfare Hospital, Dr. George V. Van Dusen, admin., 1509 Illinois Ave., plans by Albert M. Goedde, 1452A State St., 4 story hospital addn., remodeling admin. and storage, etc. **$1,000,000.** CD 10/17.

▲ **Ind., Indianapolis**—STORE—Glendale Center, Inc., 1 W. Washington St., plans by Pereira & Luckman, 9220 Sunset Blvd., Los Angeles 46, Calif., 2 story, 236x270 ft. masonry, steel, concrete department store, **$1,500,000.**

▲ **Iowa, Sioux City**—HOME FOR AGED—Lutheran Synod of Iowa, South Dakota and Nebraska, c/o William Beuttler, archt., 522 Fourteenth St., fireproof rein.-con. predomination Martin Luther Home for Aged to house 340 guests in Morningside addn. **$3,000,000.** CD 11/14.

▲ **Md., Baltimore**—HOSPITAL—St. Agnes Hospital, Caton and Wilkins Aves., plans by Faulkner, Kingsbury & Stenhouse, Ring Bldg., Wash., D. C., hospital on present site. **$7,000,000.**

▲ **Mass., Cambridge**—HOSPITAL—Mount Auburn Hospital, 330 Mt. Auburn St., plans by Marcus & Nocka, 251 Columbus Ave., Boston, hospital addn. to main bldg. adjacent to present Wyman House. **$1,750,000.** CD 2/16.

▲ **Minn., Minneapolis**—HOSPITAL—Abbott Hospital, F. Briggs, admin., 110 E. 18 St., plans by Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis, 4 story hospital addn. and a new front to main bldg. **$1,300,000.** CD 4/2/54.

▲ **Minn., Minneapolis**—MEDICAL CENTER—Franklin Medical Center, L. Sachs, Builders Exchange Bldg., 6 story medical center at Franklin and Blaisdell Aves. **$1,000,000.**

▲ **Mo., Kansas City**—STUDENT UNION—University of Kansas, c/o Dr. Richard M. Drake, acting chancellor, 5100 Rockhill Rd., plans by Hardy & Schumacher, 424 Scarritt Bldg., Kansas City, Mo., student union bldg., 50 and Holmes Sts. **$1,117,000.**

▲ **N. J., Paterson**—OFFICE—707 Broadway Corp., 707 Broadway plans by Fordyce & Hambry, 70 West 40th St., New York, N. Y., 3 story medical and professional office, Broadway and E. 33rd St. **$1,000,000.** Bids Mar. 15.

▲ **O., Cincinnati**—HOSPITAL—Our Lady of Mercy Hospital, Rowan Hills Dr., Mariemont, plans by Maguolo & Quick, 3329 Glenmore St., 50-bed hospital addn., Mariemont. **$1,000,000.** Bids in January. CD 9/15/55.

▲ **Pa., Pittsburgh**—OFFICE—Equitable Life Insurance Co., 393 Seventh Ave., New York, N. Y., plans by Harrison & Abramovitz, 630 Fifth Ave., New York, N. Y., 22 story, bsmnt., steel, aluminum office in the Gateway Center. **$10,500,000.**

▲ **Tex., Dallas**—SCHOOL PLANT—Bishop College, Marshall, complete school plant. **$1,000,000.**

▲ **Tex., Fort Worth**—BANK, etc.—Lowich Brothers, Professional Bldg., Waco, plans by Wyatt C. Hedrick & Co., 1200 T & P Bldg., 23 story, bank-office and commercial bldg., 8th and Washington Sts. **$3,000,000.**

▲ **Tex., San Antonio**—HOSPITAL—Santa Rosa Children's Foundation, c/o Santa Rosa Hospital, Santa

Rosa and W. Houston Sts., or c/o Jack Judson, 131 Mary D. St., plans by Phelps & DeWees & Simmons, 342 W. Woodlawn St., San Antonio and O'Connell & Probst, 504 W. 7th St., Austin, 5 story, 100-bed childrens hospital. $1,600,000. CD 6/21, under Childrens Hospital Foundation as owner.

▲ **Wash., Spokane**—CLUB—Young Men's Christian Assn., W 827 First St., plans by Whitehouse, Price, DeNeff & Deeble, Hutton Bldg., 9 story, rein.-con. club bldg. $2,000,000. CD 11/28.

▲ **T.H., Honolulu**—SHOPPING CENTER—Sears Roebuck & Co., 925 S. Homan St., Chicago, Ill. and Hawaiian Dredging Co., Honolulu, Ala Moana Shopping Center, incl. Sears Roebuck store, 60 other stores, parking garage and 14 story office. $25,000,000. To go ahead in March.

▲ **B. C., Vancouver**—OFFICE—B. C. Telephone Co., 768 Seymour St., plans by McCarter, Nairne & Partners, 1930 Marine Bldg., 12 story, 120x125 ft. office in 700 blk. Seymour St. $3,000,000.

▲ **Ont., Ottawa**—APARTMENT—Wyckoff & Co., Ltd., 1431a Bishop St., Montreal, Que., plans by F. Tremblay, 3110 Maplewood Ave., and Andre Blouin, 515 Cote St. Antoine Rd., Montreal, Que., apartment bldgs., 250 units, Lavergne Blvd., Eastview. $2,000,000.

▲ **Que., Montreal**—HOME—Le Foyer de Charite, 3600 32nd Ave., Pointe aux Trembles, Old People's Home addn. $1,000,000.

▲ **Que., Montreal**—INSTITUTE—L'Institut Dominique Savio, 171 St. Catherine St. W., plans by Roland Dumais, 3995 Sherbrooke St. E., Institue for Boys, Domaine St. Sulpice. $1,200,000.

▲ **Sask., Regina**—OFFICE—Saskatchewan Power Corp., Regina, plans by Joseph Pettick, 305 Brent Bldg., 14 story, rein.-con. office, Victoria St. near Scarth St. $4,000,000. CD 3/28, under Public Buildings.

INDUSTRIAL BUILDINGS

▲ **Mass., Lexington**—INDUSTRIAL DEVELOPMENT—Associated Realty Trust, 130 Newmarket Square, Roxbury, plans by Carl S. Priestley, 131 State St., Boston, industrial development, Rtes. 128 and 2A, 14 acres, $2,000,000; industrial development 36 acres Rtes. 128 and 2A, Marrett Rd., $3,500,000, Stephen Hopkins Assoc., Inc., 130 Newmarket Square, Roxbury, consult. engr. Constr. in 1957.

▲ **Mass., Westwood**—INDUSTRIAL DEVELOPMENT—New York, New Haven & Hartford R.R. Co., T. P. Polson, ch. engr., 54 Meadow St., New Haven, Conn., industrial development, parking, 100 acres Rte. 128, $1,000,000. Fay, Spofford & Thorndike, 11 Beacon St., Boston, consult. engrs.

▲ **New Jersey**—MILL—Phoenix Iron & Steel Co. (sub. Barium Steel Corp.), Phoenixville 1, Pa., first phase steel mill, 800,000 ingot ton capacity oxygen blown steel mill on Delaware River between Camden and Trenton, $85,000,000.

▲ **N. J., Florence**—PLANT—Phoenix Iron & Steel Co., 25 Broadway, New York, N. Y. and Phoenixville, Pa. (exec. office), constr. steel production plant, $75,000,000. CD 12/20, under New Jersey.

▲ **N. Y., Dunkirk**—GENERATING UNITS—Niagara Mohawk Power Corp., 300 Erie Blvd., Syracuse, Zone 2, two 200,000 kw generating units at Dunkirk Steam Generating Station, on Lake Erie, $75,000,000.

▲ **O., Cincinnati**—PLANT—Cincinnati Gear Co., Wooster Pike, plans by C. L. Baxter & Assoc., Oak St., Mariemont, 100,000 sq. ft. plant for mfg., east side Kenwood Rd. $1,250,000. Bids summer 1957. Hixon & Tarter, 2306 Park St., consult. engrs. CD 5/8.

▲ **Pa., Pittsburgh**—PLANT—Pepsi-Cola Metropolitan Bottling Co., 1807 Fifth Ave., Pittsburgh, 1 story, 90,000 sq. ft. brick, block bottling plant and warehouse $1,000,000. CD 3/20/46.

▲ **Pa., Reesedale**—TURBO GENERATOR—West Penn Power Co., Cabin Hill, Greensburg, 156,250 kilowatt turbo-generator for second unit Armstrong Power Station, $30,000,000.

▲ **Tex., Baytown**—PLANT—Humble Oil & Refining Co., 1210 Main St., Houston, 80 million bbls. per year ethylene unit. $1,000,000. To go ahead 1958.

▲ **Alberta**—PLANT—California Standard Co. (subsidiary Standard Oil Co. of Calif., 225 Bush St., San Francisco, Calif.) Calgary, plant to dehydrate and extract carbon dioxide and hydrogen sulphide from natural gas prior to feeding natural gas into Trans-Canada line in Princess Field area, 25 mi. northeast of Brooks. $10,000,000.

▲ **B. C., Vancouver**—PLANT—Western Canada Steel Ltd., Granville Island, Vancouver, steel ingot plant, docking facilities, 140-acre site, Twigg Island in Fraser River, near here. $2,000,000.

UNCLASSIFIED

▲ **Mich., Grand Rapids**—PARKS, etc.—City, Mayor George G. Goebel, City Hall, parks, playgrounds and recreational facilities. $2,000,000. Raymond Bruggink, city engr. CD 2/6/56.

▲ **Mich., Grand Rapids**—STREET LIGHTING—City, Mayor Paul G. Goebel, City Hall, street lighting, city wide imprvs., addn. to street-lighting facilities, $2,600,000. Raymond Bruggink, city engr.

▲ **N. J., Jersey City**—MARINE TERMINAL—City, City Hall, marine terminal, and bulkhead, fill, dredging sewer and water lines roads and docks. $6,900,000. CD 11/7/55.

▲ **N. Y., Buffalo**—RECREATION CENTERS, etc.—City, Dpt. P. Wks., 12 recreation centers and shelter houses, $9,195,000; park and playfield development program, $1,322,850. CD 9/14/44.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION

Northern Illinois Toll Highway

ADVERTISEMENT FOR BIDS

CONTRACT T—8A; CONTRACT T—11A; CONTRACT N—4C AND CONTRACT E—1D

Sealed proposals for contracts listed and described below will be received by The Illinois State Toll Highway Commission at its office, 20 N. Wacker Dr., Chicago 6, Ill., until 11 A. M., C. S. T., on Thursday, Jan. 24, 1957, and then immediately open to the Hal Taberin Room of the Sherman Hotel, Randolph and Clark Streets, Chicago, Ill., publicly opened, and read aloud.

CONTRACT T—8A

The Work to be done under this Contract shall be commenced on April 1, 1957, or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before December 15, 1958, and consists of:

The construction of a six lane bridge structure, exclusive of furnishing, fabricating and erecting structural steel, for approximately 0.6 miles of the Northern Illinois Toll Highway in Construction Section T—8A thereof, beginning at a point south of Franklin Avenue, extending across the Chicago, Milwaukee, St. Paul and Pacific Railroad Bensenville Yards, Mannheim Road (US 45) and other property adjacent to the above mentioned locations between centerline station 2145+38 to centerline station 2176+56 of the Tri-State Route in Cook County, Illinois.

The approximate quantities of the principal items of work are as follows:

Borrow	100,000 C. Y.
Structural Excavation, Common	7,200 C. Y.
Furnishing 14" diameter metal pile shells	56,000 L. F.
Driving and filling 14" diameter metal pile shells	49,000 L. F.
Structural Concrete	21,000 C. Y.
Reinforcing Steel	3,600,000 Lbs.
Handrail, Aluminum	6,300 L. F.
Wrought iron drain pipe 6"	6,500 L. F.

CONTRACT T—11A

The Work to be done under this Contract shall be commenced on May 1, 1957 or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958, and consists of:

The grading, drainage, paving, the construction of appurtenances, and the erection of precast concrete bridges for approximately 3.071 miles of the Tri-State Route of the Northern Illinois Toll Highway in Construction Section T—11A thereof beginning at a point about 2110 feet south of Lake Cook Road at Northern Illinois Toll Highway Tri State centerline station 0+00 in Northfield Township, Cook County, Illinois, and extending northerly to a point 6387 feet north of Deerfield Road at Northern Illinois Toll Highway Tri-State centerline Station 138+09.16 in West Deerfield Township, Lake County, Illinois, and including the westerly 0.45 miles of the Edens Spur of the Tri-State Route of the Northern Illinois Toll Highway extending easterly to a point about 1589 feet west of Huehl Road at Northern Illinois Toll Highway Edens Spur Tri-State centerline Station 26+00 in Northfield Township, Cook County, Illinois.

The approximate quantities of the principal items of work are:

Roadway Excavation	280,000 C. Y.
Borrow	351,000 C. Y.
Selected subgrade	89,200 C. Y.
Granular subbase	42,000 C. Y.
10" Reinforced PCC pavement	164,200 S. Y.
3" Bituminous Concrete Shoulders	57,500 S. Y.
Structural concrete	4,000 C. Y.
Reinforcing steel	700,000 lb.

CONTRACT N—4C

The work to be done under this Contract shall be commenced on April 1, 1957 or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958, and consists of:

The grading, drainage, paving, the construction of appurtenances, the erection of precast concrete bridges for approximately 6.40 miles of the Northern Illinois Toll Highway Construction Section N—4C thereof, lying south of the Village of Gilberts, beginning at a point 550 feet east of TR 126 at Northern Illinois Toll Highway centerline Station 1836+13.49 in Rutland Township, Kane County, Illinois, and extending easterly to a point approximately 4,000 feet east of SA 59 at the Northern Illinois Toll Highway centerline Station 2174+00 in Dundee Township, Kane County, Illinois.

The approximate quantities of the principal items of work are as follows:

Roadway excavation	1,110,000 C. Y.
Special excavation	393,000 C. Y.
Borrow	456,000 C. Y.
Special Fill	208,000 C. Y.
Selected subgrade	124,000 C. Y.
Granular subbase	67,000 C. Y.
10" Reinforced PCC pavement	190,700 S. Y.
3" Bituminous concrete shoulders	119,100 S. Y.
Reinforcing steel	700,000 lb.
Structure concrete	4,500 C. Y.

CONTRACT E—1D

The Work to be done under this Contract shall be commenced on May 1, 1957 or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958, and consists of:

The grading, drainage, paving, the construction of appurtenances, and the erection of precast concrete bridges for approximately 5.67 miles of the Northern Illinois Toll Highway in Construction Section E—1D thereof, beginning at a point about 3600 feet west of SBI Route 59 at Northern Illinois Toll Highway centerline Station 7132+00 in Naperville Township, DuPage County, Illinois, and extending easterly to a point about 5000 feet east of S. A. Route 6 at Northern Illinois Toll Highway centerline Station 7430+10 in Lisle Township, DuPage County, Illinois.

The approximate quantities of the principal items of work are as follows:

Roadway excavation	700,000 C. Y.
Borrow	740,000 C. Y.
Selected subgrade	129,000 C. Y.
Granular subbase	75,000 C. Y.
10" Reinforced PCC pavement	223,000 S. Y.
3" Bituminous concrete shoulders	113,000 S. Y.
Structure concrete	6,200 C. Y.
Reinforcing steel	981,500 lb.

All proposals must be on the forms prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents. Copies of the plans, specifications, proposal forms, and other contract documents for each contract are available for public inspection or purchase at the office of the Chief Engineer of the Commission, Room 1654, 20 N. Wacker Dr., Chicago 6, Ill. These documents may be purchased for the following sums, which sums are non-returnable: Standard Specifications for the Northern Illinois Toll Highway, $5; Proposal Form, Special Provisions, and other Contract Documents for each contract, per copy, $5; Plans for each contract, per set, $25.

A Contractor's Financial Statement and Experience Questionnaire, a Plan and Equipment Questionnaire, and a Statement of Current Contractural Obligations on forms supplied by the Commission will be required from all bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5) per cent of the total amount shown in the Proposal for the Contract; provided that the Proposal Guaranty will not be required in an amount exceeding $250,000 for any one contract. The Proposal Guaranty shall be in the form of an acceptable bid bond or a bank draft, certified check or cashier's check drawn on a solvent bank made payable to the Illinois State Toll Highway Commission.

If the bidder is an individual or partnership doing business under an assumed name, he or it shall be required to furnish prior to or at the time of submission of his first proposal, a certificate showing that such individual or partnership is registered and authorized to conduct business in Illinois under such assumed name in accordance with paragraph 4, Chapter 96 of the Illinois Revised Statutes, 1955.

If the bidder is an out of state corporation, it shall be required to furnish a certificate from the Secretary of State of Illinois as evidence that the corporation has complied with the Illinois Foreign Corporation Statutes, and that the corporation is authorized to transact business in the State of Illinois.

Award of the above contracts if any awards be made, will be to the lowest responsible bidder or bidders. The Commission reserves the right to reject any or all proposals and to waive technicalities.

Write, wire or phone for detailed information and necessary forms, Chief Engineer, Room 1654, 20 N. Wacker Dr., Chicago 6, Ill. Telephone FRanklin 2-7020.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION,
By Austin L. Wyman, Chairman

Date 12-31-56

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 7 Connecticut
STREETS AND ROADS
January 7 Connecticut

▲† **Mass., Chicopee Falls**—HEATING PLANT—BA 1/15—U. S. Eng., 150 Causeway St., Boston, addn. heating plant, district heating sys., Westover Air Force Base, ENG-19-016-57-104. $1,250,000-$1,500,000. Plans deposit $15, refundable. Extended date. Buerkel & Co., Inc., 24 Union Park St., Boston, engr. CD 11/27.

BUILDINGS—BA

▲ **Mass., Shrewsbury**—SCHOOL—BA 1/18—Town, c/o Supt. Schools, Church Rd., Junior-Senior High School, Oak St. $2,658,500. Plans deposit $100, refundable. L. W. Briggs Assoc., Inc., 90 Park Ave., Worcester, Mass., archt. CD 1/17.

BUILDINGS—LB & CA

▲ **Tocci Bros. Constr. Co., Inc.**, 38 Colonial Ave., Newtonville, Mass., CA $2,023,064, HIGH SCHOOL, Washington St., CANTON, MASS. Town High School Bldg. Comn., High School, Canton, Mass. Bids Nov. 20. CD 11/28, under LB.

▲ **Walsh Brothers**, 150 Hampshire St., Cambridge, Mass. CA $2,124,000. Jesuit NOVITIATE, Shadowbrook, LENNOX, MASS. New England Province of the Society of Jesus, Very Rev. William E. Fitzgerald, provincial, 297 Commonwealth Ave., Boston, Mass. Bids Dec. 4. CD 11/13.

▲ **M. I. O'Connor, Inc.**, 694 Bridge St., Northampton, Mass. CA $1,880,276, est. $1,808,000. M-718 ADMISSION-TREATMENT BLDG., State Hospital, NORTHHAMPTON, MASS. State, Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. CD 11/20, under LB.

▲ **G. L. Rugo & Sons, Inc.**, 80 Boylston St., Boston, Mass. CA $1,461,000. Regional JUNIOR-SENIOR HIGH SCHOOL, Rte. 113, Main St., WEST NEWBURY, MASS. Pentucket Regional School Dist., c/o Supt. Schools, Merrimac Elementary School, Merrimac, Mass. Bids Nov. 8, awarded Dec. 10. CD 11/14, under LB.

▲ **Gilbane Building Co.**, 90 Calverly St., Providence, R. I., LB $3,990,000, JUNIOR-SENIOR HIGH SCHOOL, off Phenix Ave., CRANSTON, R. I. City, School Comn., Park Ave., Cranston, R. I. Bids Dec. 19. CD 11/20.

▲ **E. Turgeon Constr. Co., Inc.**, 42 Weybosset St., Providence, R. I. CA $2,983,726. COLLEGE of EDUCATION BLDGS., Bid No. 394 to 401, Proj. No. Rice-23, Mt. Pleasant Ave., PROVIDENCE, R. I. State R. I. & Prov. Plants, Div. Purchase, State House, Providence, R. I. Bids Nov. 27. CD 11/29, under LB.

▲ **Turner Constr. Co.**, 420 Lexington Ave., New York, N. Y. CA Est. $7,500,000. 200x1,150 ft. TUBE MILL, railroad siding, 12 mi. natural gas line, Housatonic Ave., NEW MILFORD, CONN. Scovill Mfg. Co., 99 Mill St., Waterbury, Conn. Awarded Dec. 19. CD 7/23.

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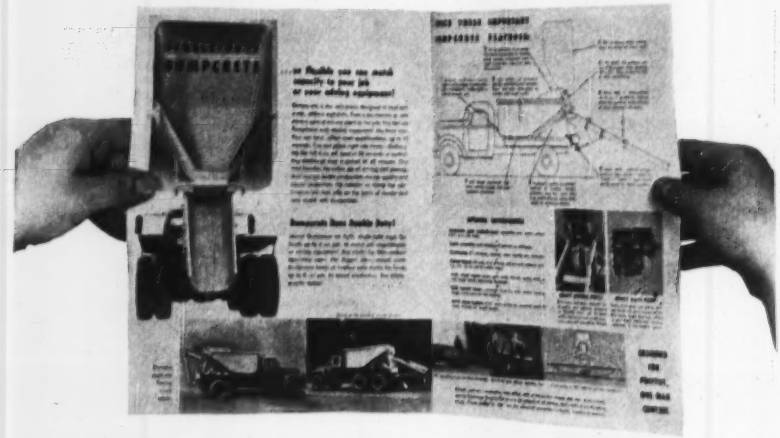

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MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 8 Maryland

▲ **Pennsylvania**—TUNNEL—BA 3/1—Pennsylvania Hy. Dpt., 506 N. Office Bldg., Harrisburg, constr. Fort Pitt Tunnel to carry Penn-Lincoln Parkway under Mt. Washington in Pittsburgh, consisting of two tubes, 3,600 ft. long, portal to portal, each with two 12 ft. traffic lanes with 1 ft. curb and 7 in. auxiliary curb offset on one side and one ft. curb offset and 2 ft. 9 in. service and refugee walk on other side. $17,000,000. CD 9/4.

BUILDINGS—BA

▲ **N. Y., New York**—SCHOOL—BA 1/18—Director Bureal Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School 149, Willis Ave. between 144 and 145 Sts., Bronx Boro. Plans deposit $25. CD 10/17.

▲ **N. Y., Whitestone**—SCHOOL—BA 1/22—Director Bureau Constr. 42-15 Crescent St., Long Island City, Zone 1, general constr. Junior High School 194, 17 Ave., 17 Rd., 154 to 157 St., Queens Boro. Plans deposit $35. CD 2/28/55.

HEAVY CONSTRUCTION—LB & CA

▲† **A. K. Wickstrom Co.**, Skaneateles, N. Y., LB $1,696,875. St. Lawrence Seaway training dike, Pollys Gut, located at entrance of South Channel of Cornwall Island sect., 7 mi. from Massena, for St. Lawrence Seaway Development Corp., CIVENG-30-023-57-28, NEW YORK. U. S. Eng., Engineer Park, Niagara and Bridge Sts., Buffalo 7, N. Y. CD 10/24.

▲ **Delphi Constr. Co., Inc.**, 500 Zerega Ave., New York, N. Y. LB $1,254,300, est. $1,300,000. Contr. No. 870, municipal refuse incinerator, WHITE PLAINS, N. Y. City, Dpt. P. Wks., 255 Main St., White Plains, N. Y. Bids Dec. 18. CD 11/21.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
J. Robert Bazley, Inc., P.O. Box 298, Pottsville, Pa. CA $2,232,086. divided hy., rein.-con., 5 rein.-con. structures, 2 prestressed precast bridges, bit. surf., two I-beam bridges, relocation and constr. of intersecting twp. roads and service roads, 5.12 mi., location between Krumville and Lenhartsville Boro, T.R. 22, Berks Co. CD 12/11, under LB.

▲† **Wark Co.**, 1920 Sansom St., Phila., Pa. LB $5,798,900. air reserve flying center, NBy 8886, WILLOW GROVE, PA. Dpt. Navy, Phila. Naval Base, Phila., Pa. Bids Dec. 20. CD 3/31/52.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,
Central Penna. Quarry Stripping & Constr. Co., 270 S. Pine St., Hazelton, Pa. LB $1,594,280. surf. 1.945 mi. relocation of US 40 from Gilpin along west slope Polish Mountain, Contr. A 464-7-620, Allegany Co. Bids Dec. 18. CD 12/5.

BUILDINGS—LB & CA

▲ **Ritter Bros.**, 1511 N. Cameron St., Harrisburg, Pa. CA $1,214,609. general constr. JUNIOR SENIOR HIGH SCHOOL, ENOLA, PA. East Pennsboro Twp., School Auth., School Bldg., Enola, Pa. CD 11/9, under LB.

▲ **Costanza Constr. Co.**, 3100 Vineyard Ave., Baltimore 18, Md. LB $1,944,000 (3 bidders) 2 story, masonry Towson Town JUNIOR HIGH SCHOOL, York Rd. north of TOWSON, MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson, Md. Bids Dec. 18. CD 12/5.

▲ **Frederic G. Krapf & Son**, 421 Orange St., Wilmington, Del., LB $618,000. Sussex DORMITORY addn. for Women, NEWARK, DEL. University of Delaware, Newark, Del. Bids Dec. 20. CD 12/11;
Thompson Constr. Co., 429 Delaware Ave., Camden, N. J., LB $1,049,828. Sussex HALL addn. and an extension to Brown HALL for Men (Newark, N. J.);
J. A. Bader & Co., Inc., 923 Market St., Wilmington, Del. LB $1,136,000. constr. new FACILITIES on East Campus which are slated to house 308 students, (Newark, N. J.);
Irons & Reynolds, 1724 H St. N.W., Wash., D. C., LB $2,219,725 and **Baton Co.**, International Airport, Phila., Pa. combined bids for two EXTENSIONS and two new DORMITORIES (Newark, N. J.).

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
January 15 Florida

BUILDINGS—SLC

▲† [illegible]—COMMUNICABLE DISEASE CENTER—General Services Admin. P. Bldg. Serv. Regional Office, 50 Seventh N. E., soon lets contract, communicable disease center. $12,300,000. CD 11/16.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., Central Hys., Office Bldg., 1221 E. Broad St., Richmond, Va.—**Donald H. Selvage,** Amherst, Va., LB **$137,180** (2 bidders) 192 ft. bridge and 0.56 mi. soil aggregate base, Rte. 649, State Proj. 1376-17-18, Fed. Proj. S-936 (1), Prince William Co.;

Va.—**L. S. Ayrnathy & Co.,** Rte. 4, Glen Allen, Va., LB **$78,172** (3 bidders) 145 ft. bridge over Little Totuskey Creek, Rte. 620. State Proj. 1379-10-11, Fed. Proj. S-916 (1), Richmond Co.;

Va.—**F. W. Dodson,** Fishersville, Va., LB **$103,354** (10 bidders) 203 ft. bridge over Cow Pasture River, near Williamsville, Rte. 678, State Proj. 1308-14-15, Fed. Proj. S-77 (1), Bath Co.;

Va.—**Sanford Constr. Co.,** Sanford, N. C., LB **$481,588** (2 bidders) 752 ft. bridge and 0.74 mi. soil aggregate approaches, Rte. 501, State Proj. 2041-16-17, Fed. Proj. F-019-1 (2), Halifax Co.;

Va.—**McLean Contg. Co.,** Fidelity Bldg., Baltimore, Md. LB **$1,032,865** (2 bidders) 1,528 ft. bridge over Lynnhaven Inlet and approaches Rte. 60, State Proj. 2175-09-12, Fed. Proj. F-037-1 (3), Princess Anne Co.;

Va.—**Norfolk Contg. Co.,** Box 4525, Norfolk, Va., LB **$113,912** (5 bidders) overpass and approaches, Virginia R.R. Rte. 137, State Proj. 3955-02-03-04. Fed Proj. SG-952 (1), Lunenburg Co.;

Va.—**English Constr. Co., Inc.,** Altavista, Va., LB **$82,261** (4 bidders) overpass and approaches N. & W. R.R., Rte. 126, State Proj. 6115-02-03, Fed. Proj. SG-900 (1), Campbell Co. Bids Dec. 19. CD 12/4.

▲† **Algernon Blair, Inc.,** Box 749, Montgomery, Ala. LB **$2,340,357.** (5 bidders) four 326-man barracks and central heating plant modifications, ENG-44-110-57-12, FORT EUSTIS, VA. U. S. Eng., foot of Front St., Norfolk 1, Va. Bids Dec. 19. CD 12/5.

BUILDINGS—LB & CA

▲ **General Services Admin.,** P. Bldg. Serv., General Service Bldg., 7 and D Sts. S.W., Wash., D. C. received no bids Dec. 20, lease-purchase project FEDERAL OFFICE BLDG., HUNTINGTON, W. VA. Est. **$2,979,000.** CD 11/16.

▲ **Harry Dinnerstein,** 6401 N. Bay Rd., Miami Beach, Fla., project postponed, Beau Rivage HOTEL, Collins Ave. and 99 St., BAL HARBOR VILLAGE, FLA. LB **$3,500,000.** CD 8/7, under LB.

▲ **A. C. Samford,** Box 1229, Albany, Ga., LB **$4,545,000.** South Fla. State Mental HOSPITAL, Stage 2, Pembroke Rd. and N.W. 27 St., FORT LAUDERDALE, FLA. Bd. Comrs. State Institutions, State Capitol, Tallahassee, Fla. CD 11/15.

▲ **Southern Constr. Co.,** Old Savannah Rd., Augusta, Ga., LB **$1,433,841.** construct and finance 100 HOUSING units for military personnel at Ft. McClellan in two and three bedroom units, FORT McCLELLAN, ALA. U. S. Eng., 2301 Grant St., Mobile 7, Ala. Bids Dec. 6. CD 11/20.

▲ **Wilkinson & Snowden, Inc.,** Delux Areade Bldg., Memphis, Tenn. LB **$7,298,800.** (8 bidders) construct and finance 480 HOUSING units, (Capehart) Columbus Air Force Base, COLUMBUS, MISS. Procurement & Contg. Office, Columbus Air Force Base, Columbus, Miss. Bids Dec. 18. CD 12/4.

MIDDLE WEST

BUILDINGS—BA

▲ **O., Cincinnati**—HOSPITAL—BA 2/4—Potter-Tyler-Martin & Roth, archts., 128 E. 6 St., 85-bed hospital addn., V-shaped bldg. for Bethesda Hospital, Oak and Winslow Ave. $2,600,000. Plans deposit $75. Proctor-Ingels, 18 E. 4 St., engrs. CD 10/12/55.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

O.—**V. N. Holderman & Sons, Inc.,** 890 Oakland Park Ave., Columbus, O., LB **$2,118,587,** est. $2,651,000 (9 bidders) Type T-71 and structures 5.484 mi. USR 30-0.00, 5.79, F-1072 (1), Ashland and Richland Counties. LB **$3,164,773,** est. $3,460,000 (9 bidders) Type T-71 and structures 6.666 mi. USR 40-14.81, I-520 (13), Licking Co.;

O.—**John R. Jurgensen Co.,** 3535 Round Bottom Rd., Newtown, O., LB **$391,653,** est. $427,000 (4 bidders) Type T-35 on B-119, 4.096 mi. SR 73, (11.81-13.42), R-RD-18 (1), Clinton Co.;

O.—**Hatcher Bros., Inc.,** 116 Schoolway, Mingo Junction, O., LB **$643,583,** est. $866,200 (7 bidders) Type T-35 on B-119 and structures 0.997 mi. SR 151, 4.91; SR 212, 0.32, S-SG-780 (2), SG-47 (2), Harrison Co.;

O.—**J. A. Jones Constr. Co.,** P. O. Box 966, Charlotte, N. C., LB **$3,826,815,** est. $4,111,000 (8 bidders) Type T-71 and structures 8.182 mi. USR 40-8.67, I-529 (11), Licking Co.;

O.—**Fenton Constr. Co.,** P. O. Box 310, Ashland, O., LB **$349,528,** est. $366,300 (2 bidders) Type T-35 on B-119, 3.506 mi. SR 55-12.15, S-369 (3), Miami Co.;

O.—**Bates & Rogers Constr. Corp.,** 600 W. Jackson Blvd., Chicago, Ill., LB **$4,055,087,** est. $4,351,000 (6 bidders) Type T-71 and structures, USR 25-(15.16) (16.73), I-1088 (1), Montgomery Co.;

O.—**D. W. Winkelman Co., Inc.,** 205 Harrison St., Syracuse, N. Y., LB **$2,262,373,** est. $2,533,000 (7 bidders) Type T-71 and structures 4.646 mi. SR 18, 0.00, 16.23, F-U-1086 (2), Portage Co.;

O.—**Herman B. Hune,** Box 284, Marietta, O., LB **$587,003,** est. $574,300 (4 bidders) Type T-35 and structures 2.58 mi. SR 73-20.78, S-492 (4), Scioto Co.;

O.—**Jones Asphalt Paving Co.,** Rte. 1, Wooster, O., LB **$142,332,** est. $168,500 (9 bidders) Type T-35 on B-119 and structure 0.858 mi. SR 603-(4.03-4.17), Ashland Co.;

O.—**Walter L. Follmer,** P. O. Box 173, Hamilton, O., LB **$867,643,** est. $941,600 (6 bidders) Type T-35 on B-119 and structure 5.079 mi. USR 127-14.82, Butler Co.;

O.—**Penker Constr. Co.,** 1030 Summer St., Cincinnati, O., LB **$3,214,364,** est. $3,548,500 (3 bidders) Type T-71 and structures 0.776 mi. USR 50-22.04, City of Cincinnati, Hamilton Co.;

O.—**Claude A. Janes, Inc.,** Box 127, Chesterhill, O., LB **$736,000,** est. $969,500 (7 bidders) Type T-71 and structures 3.583 mi. USR 33-(14.37-17.38), Hocking Co.;

O.—**S. E. Johnson Co.,** P. O. Box 29, Maumee, O., LB **$1,049,868,** est. $1,174,400 (2 bidders) Type T-35 and structures 3.65 mi. USR 20 (10.63-12.44), Lucas Co.;

O.—**Soda & Luscher Constr. Co., Inc.,** 1345 Warren Ave., Niles, O., LB **$519,218,** est. $483,400 (2 bidders) Type T-35 on B-70, 1.336 mi. USR 422-3.72, Mahoning Co. Bids Dec. 18. CD 12/7.

▲ **ILLINOIS**—Illinois State Toll Hy. Comn., 20 N. Wacker Dr., Chicago, Zone 6.

Public Constructors, Inc., P. O. Box 247, Gloucester City, N. J. and **John C. Peterson Constr. Corp.,** 958 Church St., Baldwin, L. I., N. Y. CA **$4,851,423.** Contr. N-1A and B combination, grading, drainage, paving, appurtenances, precast concrete bridges for 3.482 mi.; and grading, drainage, paving, appurtenances, precast concrete bridges and steel beam stringer bridges for approx. 3.814 mi., Northern Illinois Toll Hy., Winnebago Co. Bids Nov. 8, awarded Nov. 30. CD 11/19, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Escanaba,

Mich.—**Bossell, Van Vechten & Chapman,** Baraboo, Wis. LB **$1,075,048.** aggregate surf. 6.09 mi. relocation M-95 from about 2.7 mi. south of Republic north to about 1½ mi. north of village limits, Marquette Co.;

Mich.—**Louis Garavaglia and Pierson Contg. Co.,** 24240 Mound Rd., Center Line, Mich. LB **$1,235,801.** 6.098 mi. various types of constr. U. S.-2, U. S.-41 and M-35 for dual roadway from Escanaba north to Gladstone, Delta Co.;

Mich.—**I. L. Whitehead,** Sault Ste. Marie, Mich. LB **$371,894.** aggregate base 5.9 mi. on M-48 from U. S.-2 easterly, Chippewa Co.;

Mich.—**Bacco Constr. Co.,** Iron Mountain, Mich. LB **$293,296.** aggregate base 2.9 mi., reconstr. M-28 from Presque Isle River, easterly, Ontonagon and Gogebic Counties;

Mich.—**George Hocking,** Donken, Mich. LB **$126,353.** 22 ft. wide aggregate surf. 4.1 mi. FAS Rte. 970 from east limits of Ontonagon easterly, Ontonagon Co. Bids Dec. 11. CD 11/29, 11/20 and 12/5.

Waterproofing approach walls Patapsco Tunnel between Baltimore and Brooklyn, Md. Waterproofing by Anchor Waterproofing Corp., New York City and Railroad Waterproofing Corp., Lynbrook, N. Y. joint venture.

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BUILDINGS—LB & CA

▲ **Berzin Builders**, 25411 Chardon Rd., Cleveland 17, O. Own Forces. $9,000,000. 400 HOMES, 100-acre site adjoining Pine Ridge Golf Course and extending to Euclid, WICKLIFFE, O.

▲ **Geronetta Constr. Co.**, 857 Virginia St., Gary, Ind. CA $1,184,600. 2 story, brick Hobart Twp. HIGH SCHOOL Huber Blvd., near HOBART, IND. Hobart Twp. School, 3452 Central Ave., East Gary, Ind. CD 10/30.

▲ **General Services Admin.**, P. Bldg. Serv., U. S. Courthouse, 219 S. Clark St., Chicago, Ill., received no bids Dec. 20, lease-purchase project, U. S. post office, corner E. Walnut and N. Jefferson Sts., GREEN BAY, WIS. Est. $1,485,000. CD 11/16.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ **Colo., Fort Collins**—DORMITORY—BA 2/1—Colorado A & M College, Campus, Fort Collins, 3 story women's dormitory. $1,350,000. James M. Hunter, 1126 Spruce St., Boulder, engr.-archt. CD 7/6.

BUILDINGS—SLC

▲ **Iowa, Council Bluffs**—POST OFFICE, etc.—General Services Admin., 2306 E. Bannister Rd., Kansas City, Mo., soon lets contract post office and courthouse bldg. $1,500,000. R. C. Robinson, 310 Park Bldg., Council Bluffs, and Brooks Borg, 815 Hubbell Bldg., Des Moines, archts. CD 12/21.

HEAVY CONSTRUCTION—LB & CA

▲† **Mississippi Valley & Engineering & Constr. Co.**, 787 S. Willett St., Memphis, Tenn. LB $1,062,525. est. $895,790. (8 bidders) Pilot Canal excav., dike and revetment, Little Blue to Fishing River Bends, near Sibley, Inv. 57-42, MISSOURI. U. S. Eng., Federal Office Bldg., Kansas City Mo. Bids Dec. 18. CD 12/12, under LB.

▲ **TEXAS**—State Hy. Comn., Austin,
United States Steel Corp., 71 Broadway, New York, N. Y. CA $3,502,483. 0.339 mi. Hy. US 181, Corpus Christi Ship Channel Bridge, Contr. III. Proj. U 204 (8), Nueces Co. Bids Dec. 11, awarded Dec. 17. CD 12/14, under LB.

BUILDINGS—LB & CA

▲ **Meinecke-Johnson Co.**, 5 N. 14 St., Fargo, N. D. LB $1,799,500. general constr. two JUNIOR HIGH SCHOOLS in Moorhead and ELEMENTARY SCHOOLS in Sabin and Georgetown, MOORHEAD, MINN. Bd. Educ., Independent School Dist. No. 122, C. A. Halmrast, clk., Moorhead, Minn. Bids Dec. 12. CD 10/23.

▲ **Long Constr. Co.**, 810 Rialto Bldg., Kansas City, Mo. LB $2,383,000 (1 bidder) POST OFFICE and COURT HOUSE, KANSAS CITY, KAN. General Services Admin., 2306 E. Bannister Rd., Kansas City, Mo. CD 11/16, under Public Buildings.

▲ **Albuquerque Building Co.**, First National Bank Bldg., Dallas, Tex. LB $5,536,840 (1 bidder) land-purchase project Federal OFFICE, ALBUQUERQUE, N. M. General Services Admin., Denver Federal Center, Denver, Colo. Bids Dec. 20. CD 11/16.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
January 16 California
STREETS AND ROADS
January 16 California

BUILDINGS—BA

▲ **Calif., Yuba City**—HIGH SCHOOL—BA 1/16—Yuba City Union High School, Yuba City high school addn. $1,500,000. Plans deposit $25. Gordon Stafford, 1024½ J St., Sacramento, archt. CD 12/7.

HEAVY CONSTRUCTION—LB & CA

▲ **S. Morgan Smith Co.**, Lincoln and Hartley Sts., York, Pa. CA $11,660,975. 7 turbine units and associated equipment for Rocky Reach hydro project, WENATCHEE, WASH. Chelan Co. Public Utility, 327 W. Wenatchee Ave., Wenatchee, Wash. Bids Nov. 19. CD 11/26, under LB.

▲ **Todd Shipyards Corp.**, 1801 16 Ave. S. W., Seattle, Wash. CA $3,029,112. spillway gates for Rocky Reach dam, with guides, anchorages and hoists, WENATCHEE, WASH. Chelan Co. Public Utility Dist., 327 N. Wenatchee Ave., Wenatchee, Wash. Bids Nov. 30. CD 12/10, under LB.

▲† **Vinson Constr. Co.**, Box 930, Phoenix, Ariz. LB $2,443,874, est. $1,122,340. (1 bidder) earthwork, concrete canal lining and structures for Howard Prairie Delivery Canal, Station 0 plus 09 to Station 541 plus 00, and Soda Creek Feede Canal, Talen Div., Rogue River Basin Proj., east of Ashland, Spec. DC 4798, OREGON. Bureau Reclamation, Dpt. Interior, Bldg. 234, Camp White, Ore. Bids Dec. 18. CD 11/5.

▲ **OREGON**—State Hy. Comn., Highway Bldg., Salem, Ore.—**Morrison-Knudsen Co.**, Hoge Bldg., Seattle, Wash. CA $962,295. (7 bidders) grade 7.14 mi. US 101, FAP F-109 (4), Coos Co.;
Ore.—**C. R. O'Neil**, 2525 Hy. 99 South, Grants Pass, Ore. CA $1,246,997. (4 bidders) grading 2.83 mi. Pacific Hy., FIP 1-78 (31), Douglas Co.;
Ore.—**J. C. Compton Co.**, McMinnville, Ore. CA $165,-648. (6 bidders) grading, paving 1.11 mi. Pacific Hy., FAP 190 (18), Jackson Co.;
Ore.—**Central Paving Co.**, Box 38, Independence, Ore. CA $263,160. (8 bidders) grading, paving 16.29 mi. I-O-N Hy., FAP FLH-3 (16), Malheur Co. Grand total $2,638,100. Bids Dec. 17. CD 12/7, 12/3.

▲† **Shea Co., Henry J. Kaiser, Morrison-Knudsen Co., Macco Corp., and Raymond Concrete Pile Co.**, 2801 W. Mission Rd., Alhambra, Calif. LB $36,644,556, est. $25,549,569 (4 bidders) 11-mi. Long Clear Creek Tunnel, Trinity River Div., Central Valley proj., Spec. DC 4803, CALIFORNIA. Bureau Reclamation Dept. Interior, Weaverville, Calif. Bids Dec. 20. CD 11/9.

BUILDINGS—LB & CA

▲ **James Stewart Co.**, First National Bank Bldg., Phoenix, Ariz. LB $4,289,000. HIGH SCHOOL, TUCSON, ARIZ. Pima Co., Courthouse, Tucson, Ariz. CD 8/11/55.

▲ **Teitz Constr. Co.**, 11611 Brookhurst St., Garden Grove, Calif. Owner Builds. $1,050,000. 70 DWELLINGS, Tract 3124, GARDEN GROVE, CALIF.

▲ **Frematic Homes, Inc.**, 109 S. Gilbert St., Anaheim, Calif. Owner Builds. $1,501,200. 100 DWELLINGS, Tract 3072, LOS ALAMITOS, CALIF.

▲ **Donlen Development Co.**, 5171 W. Washington Blvd., Los Angeles 16, Calif. Owner Builds. $1,863,900. 137 stone, brick veneer DWELLINGS, Yolanda, Gledhill, Vincennes and Plummer Sts., VAN NUYS, CALIF.

▲ **Kempt Brothers**, 8750 Mettler St., Los Angeles, Calif. LB $2,032,000. (7 bidders) HIGH SCHOOL No. 5, WHITTIER, CALIF. Whittier Union High School Dist., 12100 E. Washington Blvd., Whittier, Calif. Bids Dec. 1. CD 12/10.

CANADA

BUILDINGS—BA

▲ **Man., Winnipeg**—FACTORY, etc.—BA 1/26—Dominion Envelope & Cartons (Western) Ltd., 111 Richmond St. W., Toronto, Ont., 1 story, no bsmnt., 400x400 ft. plant sect., 85x96 ft. office sect., structural steel frame, rein.-con. fdn. $1,500,000. Sheppard & Powell, Ltd., 57 Bloor St. W., Toronto, Ont., engrs. CD 5/3.

HEAVY CONSTRUCTION—LB & CA

▲ **Brush Aboe (Canada), Ltd.**, 296 Richmond St. W., Toronto, Ont., CA $1,026,646, supply, deliver and install gas engine blowers and auxiliaries Humber River Sewage Treatment Plant, north of Queensway, west bank of the Humber River, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Oct. 29, awarded Dec. 17. CD 11/12, under LB.

(Proposal Advertisement see pp. 84 to 86)

ROCKFORD

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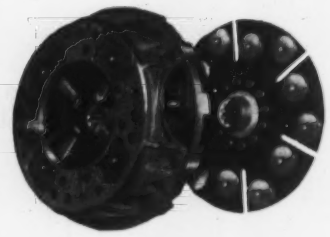

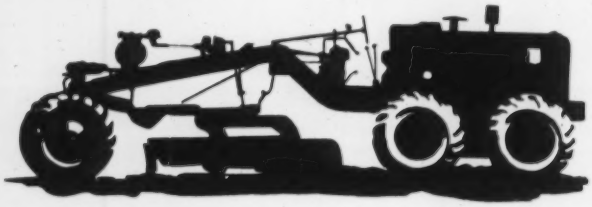

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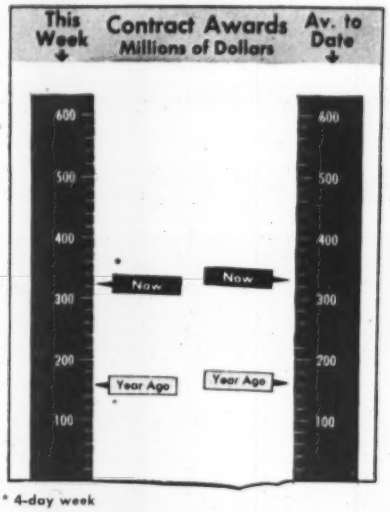
CLUTCHES

Construction Scoreboard

Activity this Week



* 4-day week

AMOUNT OF CONTRACTS LET

By Ownership	This Week*	Cum. 1 wk 1957	Chge %
	millions		
Federal	$40.6	$40.6	+51
State and Municipal	138.4	138.4	+87
Total Public	179.0	179.0	+78
Total Private	144.7	144.7	+142
U. S. Total	$323.7*	$323.7*	+102
By Type of Work			
Waterworks	$1.1	$1.1	−35
Sewerage	6.6	6.6	+128
Bridges	9.5	9.5	+67
Highways	69.1	69.1	+147
Earthwork, Waterways	14.2	14.2	+576
Buildings:			
Public, Excl. Housg.	37.4	37.4	+8
Public Housing	0.8	0.8	−82
Private Housing	74.3	74.3	+119
Commercial	9.4	9.4	+59
Industrial	55.2	55.2	+421
Unclassified	46.1	46.1	+51
U. S. Total	$323.7*	$323.7*	+102

* 4-day week

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

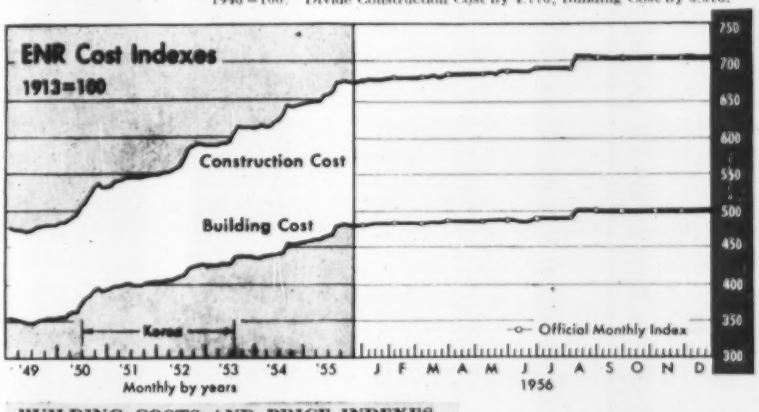
NEW CAPITAL FOR CONSTRUCTION

	Week of Dec. 27	Cum. 52 wks 1956	Chge '55-'56 %
	millions		
Corporate Securities	$46.4	$4,727.0	+31
State and Municipal:			
All Except Housing	61.5	4,689.7	−4
Housing	...	91.1	−11
Federal Loans	6.9	159.5	+24
Federal Aid	...	1,070.0	+25
Total Nonfederal	$114.8	$10,737.3	+12
Federal Appropriations:			
In U. S.	$...	$3,460.3	+2
Outside U. S.	...	15.9	−81
Total New Capital	$114.8	$14,213.5	+9

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of Dec. 27 1956	% Change from Dec. 6 1956	% Change from Dec. 29 1955
Construction Cost	705.47	−0.05	+4.3
Building Cost	499.83	−0.07	+4.0

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1940 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



BUILDING COSTS AND PRICE INDEXES

	Oct. (O) Nov. (N) Dec. (D)	Percent Change from Sept. (S) Oct. (O) Nov. (N)	Year ago
Weighted Cost Indexes (1949 = 100)			
ENR Construction Cost†	148 (D)	0 (N)	+4.6
ENR Building Cost†	142 (D)	0 (N)	+4.5
Associated General Contractors	137 (N)	0 (O)	+5.4
American Appraisal Co.*	131 (O)	0 (S)	+4.2
Marshall & Stevens, Inc.	140 (D)	+0.6 (S)	+4.7

†Official monthly indexes for December. *Adjusted for estimated productivity.

Weighted Price Indexes (1949 = 100)**			
E. H. Boeckh & Associates, Inc.			
Commercial and Factory	135 (N)	+0.1 (O)	+4.8
Smith, Hinchman & Grylls, Inc.	140 (D)	0 (N)	+4.2

**Includes overhead, profit; adjusted for estimated productivity.

Contractor Price Indexes			
Aberthaw	141 (S)	+4.9 (J)	+10.5
Austin	246 (D)	+0.5 (S)	+8.5
Fruin-Colnon	133 (D)	0 (N)	+3.3
Fuller	129 (O)‡	+2.1 (J)	+4.2
Turner	133 (O)	+1.0 (J)	+9.0

‡Fuller index shown Nov. 1, '56 not converted to 1949 base. Should have been 126 instead of 481.

HIGHWAY BID PRICE INDEXES

	Third Quarter 1956	Percent Change from Previous quarter	Year ago
Quarterly, 1949 = 100			
California Division of Highways	130.6	−2.7	+19.4
Colorado Department of Highways	101.9	+1.5	+10.4
Idaho State Highway Department	113.0*	+8.2	−5.8
Oklahoma State Highway Department	110.3	+2.6	+0.6
South Dakota State Highway Department	97.7	−3.6	+11.9
Texas Highway Department	119.6	+4.7	+10.2
Washington State Highway Commission	104.3	+1.0	+19.6
U. S. Bureau of Public Roads—Composite Mile	114.7	+3.8	+8.6

*Index shown is based on 1950 = 100.

CONSTRUCTION MACHINERY PRICE INDEXES

	Nov. 1956	Percent Change from Last Month	Year ago
BLS Indexes of Manufacturer Prices, (1947–49 = 100)			
All Types	155.5	+0.7	+9.2
Power Cranes and Shovels	155.7	+0.9	+8.8
Tractors	168.7	0	+10.9
Scrapers and Graders	148.9	0	+6.9
Mixers and Pavers	139.4	+0.9	+6.8
Machinery, Tractor Mounted	150.8	0	+7.1
Specialized Construction Machinery	140.4	+0.2	+6.1
Portable Air Compressors	146.2	+5.6	+9.4
Air Tools, Hand Held	150.0	0	+10.5

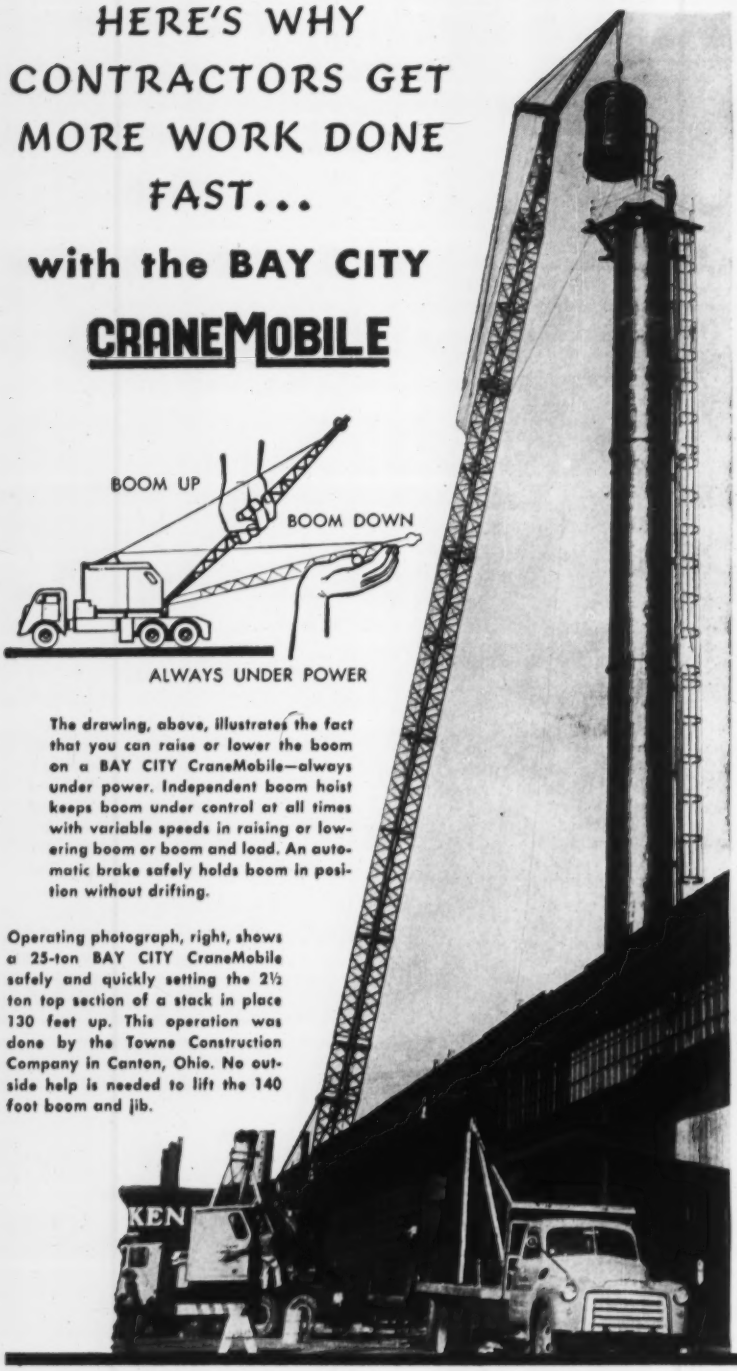
HERE'S WHY CONTRACTORS GET MORE WORK DONE FAST...

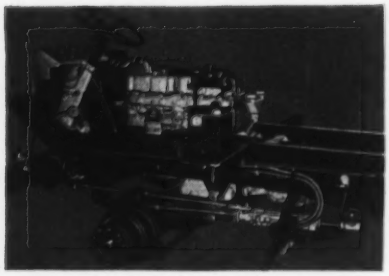
with the BAY CITY CRANEMOBILE

ALWAYS UNDER POWER

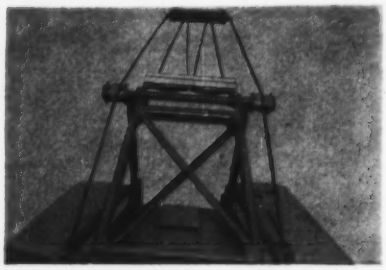
The drawing, above, illustrates the fact that you can raise or lower the boom on a BAY CITY CraneMobile—always under power. Independent boom hoist keeps boom under control at all times with variable speeds in raising or lowering boom or boom and load. An automatic brake safely holds boom in position without drifting.

Operating photograph, right, shows a 25-ton BAY CITY CraneMobile safely and quickly setting the 2½ ton top section of a stack in place 130 feet up. This operation was done by the Towne Construction Company in Canton, Ohio. No outside help is needed to lift the 140 foot boom and jib.

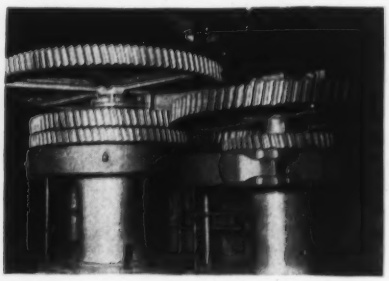




Modern Power Steering for safe, sure control of CraneMobile on the road and quicker maneuvering into position on the job. Also standard are the six-wheel air-brakes.



Hi-gantry, floating bridle and boom back-stops give positive control of long or short booms in every operating position. Gantry collapses within recessed cab-roof to reduce overall clearance when traveling.



Power load-lowering device, consisting of idler gearing between drums, permits controlled lowering of loads against engine compression without braking. Adequate power at all times is assured by high-torque, high compression, high H.P., low R.P.M. power plant.

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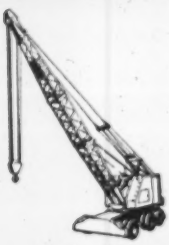

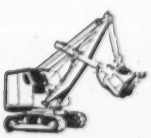

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Industrial Boom Accents Rise in Costs

The unprecedented boom in industrial building during 1956 was accompanied by a sharp rise in both building and equipment costs.

Contractors' selling prices for new industrial plant construction rose 7% during 1956, based on the average of three contractor price indexes: Aberthaw, Austin and Fruin-Colnon (see middle chart at right).

The Aberthaw Index was up 10.1%, Austin rose 8.5% during 1956. A smaller, 3.3% increase was reported by Fruin-Colnon.

Increases in the Aberthaw and Austin price indexes were more than double the corresponding 4% rise in the ENR 20-cities Building Cost Index, which measures the trend in prices paid by contractors for materials and labor.

Another example of how contractors' selling prices have risen more rapidly than costs is shown in the chart (top right). Actual costs of a manufacturing plant, are computed by Walter Kidde Constructors, New York City, by repricing the same plant in the metropolitan New York-New Jersey area.

This "actual cost" is compared in the chart with the $3 per square foot original cost in 1939—projected on the basis of the ENR Building Cost Index.

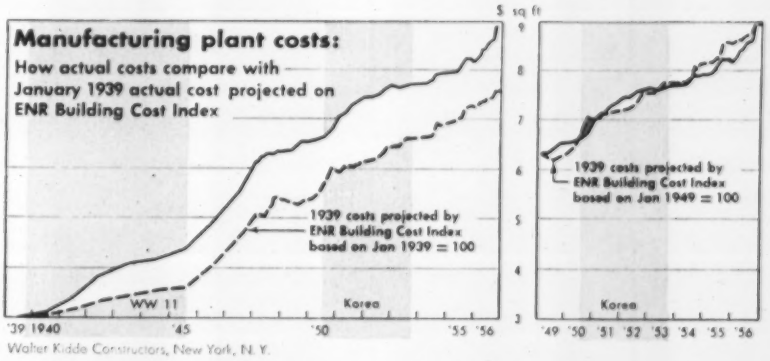
Why have contractor selling prices climbed faster than the basic costs of materials and labor? Uncertain deliveries on steel, doubts about future availability of cement and expected increases in materials prices and wage rates account for part of the rise.

Another factor is that the booming demand for industrial building created a climate in 1956 in which contractors could catch up or at least close some of the gap between prices and costs.

This gap had widened during 1954 and throughout most of 1955—a period that witnessed a sharp drop in industrial building contracts, then a recovery.

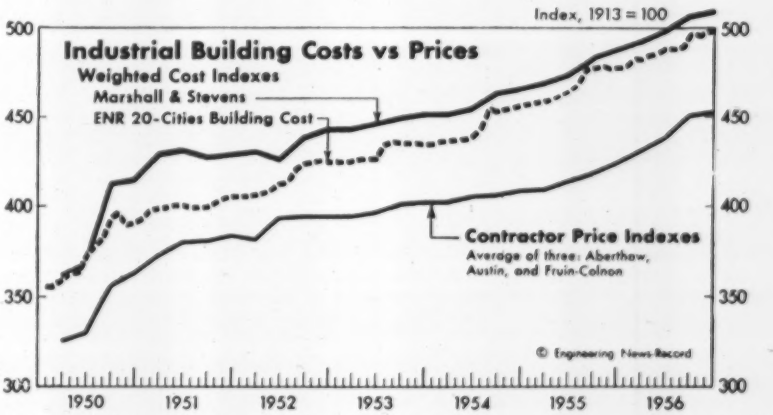
Contractor prices have responded to the demand for a new plant. But, there has been some lag. These prices rose gradually in 1954, at a slower rate than materials and labor costs accelerated in 1955 and then climbed at the fastest rate in the third quarter of 1956, following the month-long steel strike and the subsequent increase in steel prices.

Building prices, despite their sharp increase, did not go up as rapidly in 1956 as industrial equipment costs. The Marshall & Stevens Index rose 10.9% in 12 months ended December 1956.

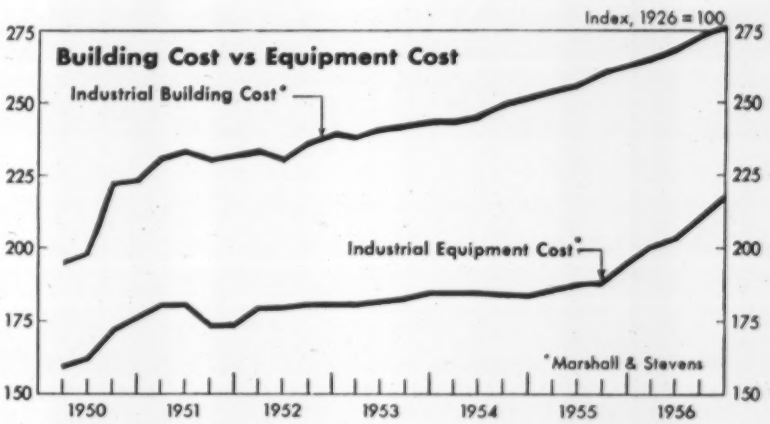

Manufacturing plant costs:
How actual costs compare with January 1939 actual cost projected on ENR Building Cost Index
1939 costs projected by ENR Building Cost Index based on Jan 1939 = 100
WW II
Korea
'39 1940
'45
'50
'55 '56
$ sq ft
1939 costs projected by ENR Building Cost Index based on Jan 1949 = 100
Korea
'49 '50 '51 '52 '53 '54 '55 '56

Walter Kidde Constructors, New York, N. Y.

ACTUAL COSTS of manufacturing plants rose faster during 1956 than the combined rise of labor and materials costs. This was a reversal of the pattern developed in 1955.



CONTRACTORS' PRICES for new industrial plant construction went up faster in 1956 than basic labor and materials costs. Uncertain materials deliveries were a factor.



INDUSTRIAL EQUIPMENT COSTS outran the increase in building costs last year.

Time Will Tell

Clock's accuracy key to award on $4-million job

Because a bidder waited until the last minute to drop his bid into the box, a $4¼-million controversy is brewing in Tucson, Ariz.

The Pima County Board of Supervisors ruled that a low bid of $4,289,000 submitted by James Stewart Co., of Phoenix, just got in under the wire. The bid was for construction of a proposed Rincon High School in Phoenix.

But, the supervisors' decision may be contested in court.

M. M. Sundt Construction Co., of Phoenix, had deposited its sealed bid in ample time before the supervisors opened the bids. As the meeting opened, the Stewart bid was deposited; and a claim was made that the Stewart bid had missed the deadline. Then the Sundt bid for $4,360,000, was opened.

A representative of Stewart checked the time clock in the supervisors' office with the telephone company's time signal. He told the supervisors that this check showed the supervisors' time clock was one minute fast; therefore, he maintained the Stewart bid had arrived in time.

But, the Sundt Company's attorney claims that his company's offer was the only valid bid.

City Didn't Tell Enough, Judge Ups Contract Price

A Michigan Circuit Court judge increased a sewer construction contract by $14,565 because he found that the city of East Lansing had failed to provide an adequate description of ground conditions and proper location of sewer and other utility lines.

But, the judge made it clear in his ruling that the additional $14,565 did not include any additional profit for the contractor, Maurice Vermeersch, of Lansing.

Vermeersch had sought $30,000.

Prefab Concrete Pilings Subject to Retail Tax

The Florida State Supreme Court has ruled that prefabricated concrete pilings are subject to the state's 3% retail sales tax.

The ruling upset a decision made by a lower court which had ruled that the pilings were not subject to tax since the sales tax law did not expressly cover such items.

Defendant in the case is Reed Construction Corp., of Miami.

Construction Markets

An On-the-Spot Report From Columbus

"Business expansion has caused the pump to run dry," succinctly explains a Columbus, Ohio, construction leader discussing the money scarcity.

Money is tight, leaders admit, but most are more than optimistic about prospects for 1957.

An ENR survey showed that local bankers, realtors, equipment and materials suppliers, architects, and engineers agree with contractors that prices will be up, overall dollar volume will be greater than in 1956 and physical volume of construction may come close to the 1956 level.

Private commercial and industrial building may be down about 5% in 1957; housing starts probably will decline slightly more than that. The new homes will carry more built-in features, have more space (four-bedroom homes are becoming a bigger market factor), will utilize improved building methods and carry higher price tags.

Any downturn in private commercial and industrial work will be more than offset by gains in school, hospital, highway and other public construction.

One example: Ohio State University plans to let contracts for $8 million worth of new dormitories in the first quarter of this year; in 1956, the total construction program for the year was only $5.7 million.

The city has assured a $23.4-million hospital expansion program through contributions and a $15-million voter-approved bond issue. The Post Office Department has authorized a $9.5-million bulk mailing facility in downtown Columbus, and the Ohio Highway Department tentatively has scheduled four contract lettings prior to April 2—for a total of about $46 million worth of construction.

The Highway Department not only has scheduled these major lettings for the first quarter of this year, but also has set up a three-year, $66.2-million non-federal aid program to be financed by receipts from the state's two-cent a gallon motor fuel tax.

Included in one of the first-quarter contract lettings will be the $6-million 3rd Street Viaduct, which will be part of the Columbus Expressway System.

Engineering reports are due before July 1 on the city's $10-million Goodale Street slum clearance program. And, a preliminary report is expected on the state's office needs, previously estimated as high as 1.1 million square feet.

Other public works projects are coming along. The Ohio Department of Mental Hygiene is preparing plans for a $1.5-million juvenile diagnostic center and a $1.1-million state hospital reception and diagnostic center. The city of Columbus is planning a $1.5-million, five-story police department addition.

Some big private projects also are worth noting. F. R. Lazarus & Co. will build a $3-million, 10-story addition to its downtown Columbus department store. The Ohio Council of Churches, which has progressively added to its holdings in the Civic Center, also may start work this year on its Temple of Good Will—a proposed $20-million skyscraper. And, another possibility is the 19-story, $6-million Chipley Realty Co. office building in the downtown area.

Although such projects are impressive, the Columbus construction economy does not rely on these multi-million-dollar jobs. Stability comes from the less spectacular, more consistent flow of warehouse jobs (in the $100,000 to $500,000 class), schools, sewerage projects and small buildings or public works.

In the aggregate, however, the Columbus construction total is big. It is geared to meet the needs of a city whose population growth has surpassed the national average consistently since World War II.

In general, there will be enough cement and other building materials to meet the needs of the area's present and proposed construction programs. But, structural steel is short and will continue to be, with delays running six months or more.

Construction equipment probably will be in good supply throughout the first quarter, but some temporary shortages may crop up at the summer peak, according to local distributors.

Price increases will be general because of higher labor and materials costs, most construction men agreed. Only lumber prices, depressed by the housing downturn, seem likely to stay near the 1956 levels.

H. C. Roane (left), Gulf's Atlanta Assistant District Manager; N. J. Harmon (center), Gulf Sales Representative; M. C. Akin (right), MacDougald Construction Company Superintendent meet on the job site to discuss how Gulf can best service the MacDougald equipment.

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keep equipment rolling on Georgia State Farmers Market

One and a half million cubic yards of dirt will be moved in grading, excavating and drainage for the new State of Georgia Farmers Market near Atlanta. MacDougald Construction Company of Atlanta has the contract for this million-dollar project.

The job is scheduled to be completed in 100 working days, so MacDougald Construction Company is using Gulf petroleum products exclusively. They know that Gulf quality lubricants protect against mechanical delays, while Gulf fuels insure top engine performance. And they know they can always rely on Gulf to make prompt deliveries.

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Steel Won't Get Tax Aid

Government rejects applications for fast amortization; some expansion plans may be deferred; price rise seen

The federal government has rejected the steel industry's bid for special tax aid to help pay for expansion programs totaling $2.3 billion.

Since the summer of 1956, steelmakers have sought government approval of rapid tax amortization privileges that could be applied to the latest round of industry expansion.

Fast tax write-offs originally were introduced during the Korean War to induce industry to build defense and defense-related facilities that were badly needed to meet the country's full mobilization program.

These write-offs do not increase the total depreciation that industry can charge on a machine or building. But, a fast tax write-off enables the company to charge off most of the total cost of the facility in five years.

This returns the money faster to the company for possible use in future capital spending. And, it means the company can take big deductions during a period of high income and high tax rates.

Depreciation has become the biggest single source of funds to pay for expansion and modernization programs. It is exceptionally important in the case of steel because the industry is planning to add 15 million tons of capacity over a three-year period.

• **May defer projects**—U. S. Steel, which had applied for fast tax write-offs on $500 million worth of construction, called the government decision "disappointing" and added that it would delay completion of some expansion projects and result in at least a temporary deferral of others.

Bethlehem, the nation's second largest producer, said it would not be able to determine the effects on its expansion program until it had an opportunity to study the matter more closely. Bethlehem had filed applications with ODM covering more than $440 million worth of construction.

Jones & Laughlin's chairman, Ben Morcell, said the firm will take another look at its plans to build a $250-million integrated mill at Houston, Texas, to produce tubing.

Other major firms, however, were not as quick to trim their sails. Republic, for example, said it will go ahead with its current $187-million expansion; Inland Steel took much the same view. It will go ahead with a three-year, $280-million program that is designed to boost its capacity to 6.3 million tons by January 1959.

No cutbacks are planned by such firms as National Steel, Pittsburgh Steel and Granite City Steel.

But Armco declined comment on its future plans. The firm had applied for tax aid on nearly $360 million worth of construction.

• **Price rise expected**—If any substantial part of the steel industry's program is curtailed, the construction industry will lose twice. These mammoth steel projects boost the size of the construction market. And, construction also is counting on some of this new capacity to relieve the critical shortage of structural shapes and plates.

Without special tax aid in the form of rapid amortization, one thing seems certain—the steel industry will raise its prices substantially to finance its expansion program.

Such price increases probably will become widespread early this year, perhaps before the end of the first quarter. Contractors will feel the effects in several ways: Mill prices will rise, the increase will be compounded slightly at the fabricator level, and, in addition, construction equipment prices probably will go up when manufacturers are confronted with still higher steel costs.

• **Alternative aid unlikely**—Steelmakers feel that alternative tax help is possible. Almost every major steel executive at some time in the past six months has asked that "a more realistic depreciation policy" be followed on the part of the government.

Steelmen want tax laws changed so that the steel industry could depreciate its equipment on a replacement cost basis, rather than on the basis of initial cost.

Such a change is necessary, they argue, to counter the effects of inflation over the long periods during which steel mills are amortized.

But accountants and most government officials oppose such a change. And, it is unlikely that Congress will take any steps to carry out the steel companies' hopes.

Within the Administration itself, the steel producers will not get any further support for special tax benefits.

The question of granting a new round of fast tax write-offs split some of the most influential members of the Eisenhower Administration into two camps. The decision, when it finally came, was made at the Cabinet level, obviously with the President's concurrence.

There is no likelihood—short of war—that the Office of Defense Mobilization will change its mind. To a question that has many ramifications for construction, ODM's answer was a firm "no"—not a "maybe."

School Construction

Pennsylvania sets up new bureau to speed program

Pennsylvania's Department of Public Instruction has established a new bureau to expedite the state's multi-million-dollar school construction program.

The Bureau of School Buildings will assist local school officials in planning their construction programs, selecting school sites, handling legal matters and processing building applications.

The new bureau, which takes over the responsibilities formerly held by the Bureau of School Administration, will have four divisions: architectural services, surveys and inspections, school development consultants and records.

It is expected to speed the process of getting school building plans approved and financing arranged.

Business Briefs . . .

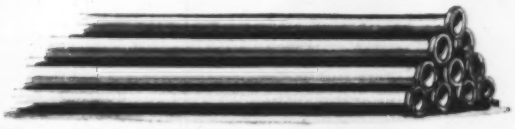
• **Push-button freight yard**—The New York Central Railroad, which will put its first electronic freight yard into operation next month at East Buffalo, N. Y., will build two others in the near future, at a total cost of about $21 million. A $14-million push-button yard at Elkhart, Ind., will replace eight separate yards in the area. A $7-million yard at Youngstown, Ohio, will take over the functions of five scattered, obsolete facilities.

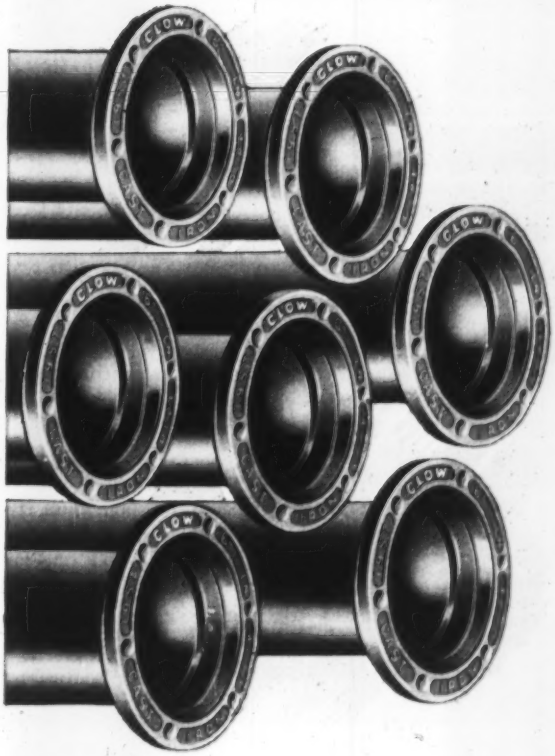
• **Big spender**—Standard Oil of New Jersey will spend $1¼ billion for refineries, pipelines, tankers, producing wells, research and other facilities in 1957.

• **More capacity**—The nation's steelmaking capacity climbed to a new high of nearly 133.5 million tons this year, up 4% over 1955, according to the American Iron & Steel Institute.

• **Evans buys Haskelite**—Evans Products Co., which produces fir plywood, lumber, hardboard and such diversified products as truck and bus heaters and bicycles, will buy Haskelite Manufacturing Corp., which makes doors, door parts and laminated wood products.

take advantage of the plus factors when you specify UNDERGROUND WATER PIPE





Experienced men who specify and install underground water pipe take advantage of the plus factors when they specify cast iron pipe.

Take the pressure plus factor. Minimum wall thickness Clow cast iron pipe (ASA A21.6 Class 22) is rated for at least 250 psi working pressure in diameters 10″ and smaller.

What does this mean? It means that cast iron pipe is rated safely above the minimum pressure requirements for municipal water service, and can be specified to the full ASA rated working pressure. This is because of the inherent strength of cast iron pipe . . . beam strength . . . compressive strength . . . bursting strength . . . all scientifically calculated with ample factor of safety on the basis of sound engineering practice and the result of actual service records.

To get the best advantage of the plus factors for your system, invite a Clow man in to discuss your requirements when pipe first enters your plans.

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SINCE 1878

AFL-CIO Sets Course for 1957

New year goals include higher standards of living, more members, Taft-Hartley Act amendments, and greater unity

The AFL-CIO started the new year with a forward rather than a backward look and has set its sights on solution of a number of problems, including several that have been smoldering in the construction industry for a long time.

In his New Year statement, AFL-CIO President George Meany broadly described the federation's major domestic challenge as that of instilling "new life and vigor into the fight here at home for liberal and progressive objectives." Items specifically mentioned include changes in the Taft-Hartley Act to make it "fair and just"; greater progress in labor unity; bolstering the national economy through higher standards of living and stronger purchasing power; statutory protection of union health and welfare funds; better schools; decent homes for low- and middle-income families; and organization of the unorganized.

The quest for higher wages—to which the AFL-CIO economically ties the health of the economy—and the goal of millions more on union membership rolls are part of what Meany calls the AFL-CIO's "basic responsibilities." But within the other challenges are three that strike deep into the heart of labor unity and in which the construction industry has a peculiar and vital interest—the jurisdictional conflict between craft and industrial unions, jurisdictional disputes within the building trades, and revision of the Taft-Hartley Act.

On each of these, this is what the new year has inherited:

• When the AFL-CIO was formed, a joint committee representing the building trades and industrial unions was appointed to seek a solution to one of the merger's most knotty problems—peaceful coexistence of craft and industrial unions. The committee met unsuccessfully while scattered disputes broke out over maintenance and repair work in industrial plants. The building trades, in an effort to protect their interests, invoked and then called off a slow-down of state AFL-CIO mergers, and in June a special subcommittee of the AFL-CIO Executive Council was named to search for a formula for handling industrial construction work. The problem is still in the lap of that committee.

• During the year, three significant developments occurred with respect to jurisdictional disputes in the building trades but none of them has done much to solve the problem: The number of settlements reached by agreement between international unions increased; the National Labor Relations Board, spurred by sporadic union disregard of National Joint Board decisions, showed a tendency to take jurisdiction over such disputes, although it has failed so far to establish any firm policy; and the lathers union continued to press its challenge of the right of the Building and Construction Trades Department to force its affiliates to comply with the Joint Board procedure. Claiming violation of union autonomy, the lathers appealed without success to the AFL-CIO Executive Council and now the Council has been asked by President Mashburn to reconsider its denial of the union appeal.

• Concurrently with organized labor's efforts to get the Taft-Hartley Act changed, a joint committee of contractors and building tradesmen was formed in November to work with Labor Secretary Mitchell on proposed changes affecting the construction industry. Under consideration are legalization of pre-hire contracts, easing of the ban on secondary boycotts at common construction sites, elimination of the mandatory injunction proceeding and repeal of Sec. 14 (b) that supports right-to-work laws. The committee has been meeting in closed session without reaching any final agreement on recommendations to the President and will convene again on Jan. 18.

Contractors Could Not Sue Carpenters in State Court

A state court in California has ruled that lawsuits by firms engaged in interstate commerce against labor unions for breach of contract cannot be filed in state courts. Jurisdiction, the court said, belongs exclusively to the Federal District Court or to the National Labor Relations Board.

The decision, which reverses a 1954 Superior Court decision, was handed down last month by the State District Court of Appeals in Los Angeles.

Three partners in a Los Angeles construction firm had filed a suit in the State Superior Court against the Los Angeles County District Council of Carpenters and three affiliated locals charging breach of contract and asking $350,000 damages and a strike injunction.

Because of the jurisdictional question, the District Court of Appeals dissolved the injunction granted by the lower court. The contractors announced that the appeal would be taken to the California Supreme Court.

AEC Sets Hearing

Labor will air opposition to Michigan nuclear plant

Under the prodding of organized labor, the Atomic Energy Commission next week will hold its first public hearing on the licensing of civilian atomic projects.

Up for questioning before the AEC on Jan. 8 is the safety of the proposed fast breeder reactor of the Power Reactor Development Co., an organization formed by 22 electric utilities and industrial concerns. The reactor, a type that produces plutonium fuel as it burns uranium, will be installed in PRDC's atomic power plant at Monroe, Mich., just outside Detroit.

Construction of the Monroe facility, which is now under way, has been opposed for several months by the auto workers, electrical workers (IUE) and paperworkers unions, which petitioned the AEC for a public hearing on the safety of the project following the issuance of a conditional construction permit by the AEC on Aug. 4. At the same time, the three unions, over the objections of the Monroe County Building Trades Council, asked the AEC to order suspension of construction pending the hearing. This the AEC refused to do.

Hearings, so far, have been twice postponed, the last being from Dec. 10 (ENR Nov. 15, 1956, p. 114). With no hearing examiner of its own, the AEC has had to go to the Federal Communications Commission to borrow its assistant chief examiner, Jay A. Kyle. The unions, primarily concerned with the safety of those who live in Detroit and Toledo, Ohio, areas, have taken the position that the AEC failed to make an affirmative finding that the facility could be operated without undue risk to the health and safety of the public and that, in the absence of such a finding, should not have issued the construction permit.

Previously, doubt had been cast on

the safety of the project in a report by the Advisory Committee on Reactor Safeguards, an advisory group to AEC. The commission has made the construction permit conditional upon solving various safety aspects of the installation. PRDC points out that the permit is not a license to operate the plant and that no fissionable material will be used until such a license is obtained—and that may not occur until 1960.

Kyle will make no findings at the conclusion of next week's hearing. He will merely certify the record to AEC for its decision.

Labor Peace Found

Voluntary settlements end disputes at N. Y. Coliseum

Voluntary settlement of jurisdictional disputes—a procedure encouraged by the building trades—has been hailed as the successful solution to the labor problems that plagued the opening of New York City's new $35-million Coliseum last spring.

Reporting on its activities during the six months since it was formed, the joint labor-management committee—to which the solution of the labor problems was entrusted—said that nearly 100 jurisdictional disputes have been settled peacefully and without a single work stoppage of any kind.

The committee was formed last May after the AFL-CIO unions engaged in the erection, maintenance and dismantling of Coliseum exhibits had agreed, under the leadership of Martin T. Lacey, to settle their disputes among themselves. At the time the International Home Building Exposition was in the Coliseum, many were complaining of exorbitant labor costs as a result of the disputes. Lacey is president of the Central Trades and Labor Council and of the teamsters' Joint Council 16.

Under the committee's procedure, pre-show conferences of the unions affected—numbering over 20—are held to work out, in advance, agreement on problems that might arise. An example of the early disputes that threatened to induce exhibitors to steer clear of the Coliseum was one between carpenters and stagehands over the right to handle crating. Such disputes are now ironed out at the conferences at which an attempt is made to share the work without any added labor costs.

The committee consists of six members each from labor and management and two who represent the public.

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

Bids: January 29, 1957

Contract HT-180.001

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
HOLLAND TUNNEL
NEW YORK PLAZA
TOLL BOOTHS

Sealed proposals for the removal of existing toll booths and the erection of new toll booths furnished by the Authority will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, January 29, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 3, 1957

Bids: January 22, 1957

Contract NYA-650.044

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CENTRAL TERMINAL AREA
TOLL BOOTHS, INFORMATION BOOTH AND REST ROOM

Sealed proposals for the construction of toll booths, information booth and rest room at the Central Terminal Area at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, January 22, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 3, 1957

Bids: January 22, 1957

Contract NYA-650.043

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CENRAL TERMINAL AREA
DIRECTIONAL SIGNS

Sealed proposals for the fabrication, erection and complete installation of directional signs in the Central Terminal Area and areas adjacent thereto at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, January 22, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 3, 1957

Bids: January 17, 1957

Contract O & M-402

ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
BUILDING 139—24 INCH SEWER LINE

Sealed proposals for furnishing all labor, material and equipment for installing a 24 inch sewer line in the vicinity of Building No. 139 at Port Newark will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11 A.M., Thursday, January 17, 1957, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, January 3, 1957

OFFICIAL PROPOSALS

Bids: January 29, 1957

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
CHANNEL ENLARGEMENT AT
POINT THREE POINTS

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked
"TENDER FOR ST. LAWRENCE POWER PROJECT CHANNEL ENLARGEMENT AT POINT THREE POINTS"
will be received up to 4.30 o'clock p.m., Eastern Standard Time, on
TUESDAY, JANUARY 29, 1957
for approximately 1,730,000 cubic yards of common excavation.
The work comprising clearing, wet and dry excavation, disposal, salvage and distribution of materials, and other incidental work, shall commence fifteen (15) calendar days after notice of the award of the contract and shall be completed by December 31, 1958.
Copies of the tendering documents may be obtained on or after Wednesday, December 19, 1956, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of twenty-five dollars ($25.00) for each set. This charge will not be refunded.
Tendering documents may be inspected at the above address and at the offices of the following: the Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.
Each tender must be accompanied by a certified cheque drawn on a Canadian chartered bank for a sum calculated as follows:
On tenders up to $500,000.00, the sum shall be 10 per cent of the total amount of the tender; on tenders over $500,000.00, the sum shall be 10 per cent of the first $500,000.00 and 5 per cent of the excess over $500,000.00.
Provision for the return of the cheques appears in the tendering documents.
The successful tenderer will be required to furnish a performance bond in the form approved by the Commission and issued by a bonding company licensed as such in the Province of Ontario and acceptable to the Commission for one hundred per cent (100%) of the total amount of the contract.
The lowest or any tender will not necessarily be accepted.

E. B. EASSON
SECRETARY

Bids: January 29, 1957

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
CHANNEL ENLARGEMENTS, VICINITY
OF MORRISBURG

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked
"TENDER FOR ST. LAWRENCE POWER PROJECT CHANNEL ENLARGEMENTS VICINITY OF MORRISBURG"
will be received up to 4.30 o'clock p. m., Eastern Standard Time, on
TUESDAY, JANUARY 29, 1957
for approximately 1,046,000 cubic yards of wet and dry excavation, the removal of crib and masonry structures and control works at lock 24, and other incidental work.
The work shall commence fifteen (15) calendar days after notice of the award of the contract and shall be completed December 15, 1959.
Copies of the tendering documents may be obtained on or after Wednesday, December 19, 1956, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of twenty-five dollars ($25.00) for each set. This charge will not be refunded.
Tendering documents may be inspected at the above address and at the offices of the following: the Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.
Each tender must be accompanied by a certified cheque drawn on a Canadian chartered bank for a sum calculated as follows:
On tenders up to $500,000.00 the sum shall be 10 per cent of the total amount of the tender; on tenders over $500,000.00 the sum shall be 10 per cent of the first $500,000.00 and 5 per cent of the excess over $500,000.00. Provision for the return of the cheques appears in the tendering documents.
The successful tenderer will be required to furnish a performance bond in the form approved by the Commission and issued by a bonding Company licensed as such in the Province of Ontario and acceptable to the Commission for one hundred per cent (100%) of the total amount of the contract.
The lowest or any tender will not necessarily be accepted.

E. B. EASSON
SECRETARY

Bids: February 5, 1957

City of Richmond, Virginia

NOTICE TO BIDDERS

Sealed Proposals will be received at the office of the Director, Purchases and General Services, 4th floor, Mosque Building, Laurel and Main Streets, Richmond, Virginia, until but not later than 11 o'clock A. M. E.S.T., February 5, 1957, at which time they will be publicly opened and read aloud, for the following work which may be awarded in whole or in part:

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division IV—Administration Building and Sludge Structures", and comprises the furnishing of all labor, materials, equipment and work incidental thereto, for the construction of the Administration Building, the Sludge Control Building, the Sludge Tanks, and interconnection tunnel, as shown, specified and directed.

Location: The Administration Building and Sludge Structures will be located at the site of the Sewage Treatment Plant, adjacent to the southwest bank of the James River at Rockett's Wharf, northeast of the United States Naval Diesel School, in the City of Richmond, Virginia.

The proposal and other contract documents may be examined at the office of the Director of Public Works, 217 Governor Street, Richmond, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of the contract documents may be obtained from the office of the Director of Public Works upon the deposit of Twenty-Five Dollars for each set. Any general contractor who submits a bona fide bid on the project will be refunded his payment in full for not more than three sets, and will be refunded fifteen dollars per set for each additional set. All others will be refunded fifteen dollars per set upon the return of the documents in good condition within ten days after the opening of the bids.

J. W. Huffman
Director of Purchases and
General Services

GOVERNMENT OF IRAQ DEVELOPMENT BOARD AND MINISTRY OF DEVELOPMENT. Construction of a plant for liquid sugar and dibis in Kerbela. CALL FOR TENDERS. The Development Board and the Ministry of Development of the Government of Iraq invite tenderers for the supply, erection and supervision of operation of a plant for liquid sugar and dibis (date syrup) and the related power station in Kerbela, Iraq. The plant will be capable at first of treating 80 tons of dates per 24 hours i.e. 40 tons for liquid sugar and 40 tons for dibis. In addition a plant will be built to manufacture the tin cans needed for the products. Tenders must be submitted for the complete project, including the civil engineering work The documents for tender, including general information, instructions to tenderers, general specifications, material list and specification sheets may be inspected from the 5th day of January 1957 until the 5th of March 1957 at the following addresses: a. Directorate General of Legal Affairs and Contracts; Ministry of Development, Development Board, Baghdad. b. Embassies of Iraq in Washington, London; and Swiss Legation in charge of Iraqi interests in Paris. c. Royal legations of Iraq in Bonn, Brussels and Rome. d. Royal Iraqi consulate of Stockholm. e. Egyptian Consulate of the Hague, Holland. f. Egyptian Consulate of Bern, Switzerland. Firms desiring to tender may obtain copies of the documents for tender, from the 5th of January 1957 to the 5th of March 1957 from either the general directorate of Legal Affairs and Contracts at the Ministry of Development Baghdad, or the above mentioned embassies, legations and consulates against payment of five Iraqi Dinars for each set, or equivalent sum in other currency That payment will not be reimbursed to Tenderers. Tenders will be drawn up in English and must be accompanied by a preliminary deposit of ID. 10,000 (Ten thousand Iraqi Dinars) to be paid in cash to the Directorate General of Accounts of the Ministry of Development, and the recipt issued for that payment must be attached to the tender. The abovementioned cash deposit may be replaced by a letter of guarantee from any approved bank in Baghdad. Tenders must be submitted in sealed envelope marked on the outside "Tender for construction of a plant for Liquid Sugar and Dibis in Kerbela" and will bear the address of the Ministry of Development, Government of Iraq, Baghdad. Enclosed in a separate envelope a letter of capacity, method of procedure and articles of association must be submitted at the same time. Tenders must be delivered to the Ministry of Development at or before noon, local time on 5th April, 1957. If sent by post, tenders will be registered, but the tenderers must assure themselves of delivery to the Board by the due time. Tenders not delivered within the specified time or not accompanied by a receipt of deposit or letter of guarantee shall be neglected. The tenderers attention is drawn to the fact that tenders will be accepted only from firms which have previously carried out works of similar character and magnitude. The Development Board does not undertake to accept the lowest or any tender. Minister of Development.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4831) will be received at Thermopolis, Wyoming, until February 28, 1957, for furnishing labor and materials for Anchor Dam (concrete) and Access Road, Missouri River Basin Project, Wyoming. Location 35 miles west of Thermopolis, Wyoming. Principal items are 64,000 cu. yds. excavation for dam foundation; 63,000 cu. yds. concrete in dam; 60,000 bbls. furnishing and handling cement; 78,000 cu. yds. excavation for roadway; and other work. Completion time 900 days. For particulars, address Bureau of Reclamation, P. O. Box 271, Thermopolis, Wyoming; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4830) will be received at Thermopolis, Wyoming, until February 28, 1957, for furnishing labor and materials for Anchor Dam (earthfill) and Access Road, Missouri River Basin Project, Wyoming. Location 35 miles west of Thermopolis, Wyoming. Principal items are 71,000 cu. yds. excavation in open cut; 5,000 cu. yds. concrete; 585,000 cu. yds. excavation in borrow and transportation to dam embankment; 78,000 cu. yds. excavation for roadway; and other work. Completion time 900 days. For particulars, address Bureau of Reclamation, P. O. Box 271, Thermopolis, Wyoming; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4829) will be received at Bridgeport, Washington, until February 21, 1957, for furnishing labor and materials for Pipe Lines for Brewster Flat Distribution System, Chief Joseph Dam Project, Washington. Location near Brewster, Washington. Principal items are approximately: 30,000 cu. yds. excavation; 81,000 lin. ft. steel pipe, various sizes; 12,000 lin. ft. asbestos-cement pipe; various valves and accessories; and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, P. O. Box 705, Bridgeport, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4824) will be received at Weaverville, California, until February 5, 1957, for furnishing labor and materials for Trinity Dam, Central Valley Project, California. Location near Lewiston, California. Principal items are 9,150,000 cu. yds. of excavation; 21,400,000 cu. yds. of excavation borrow and transportation to dam embankment; 100,000 cu. yds. concrete; Installing 16-foot diameter steel penstock, gates, valves, trashracks and other metalwork; and other work. Completion time 1800 days. For particulars, address Bureau of Reclamation, Weaverville, California; or Building 53, Denver Federal Center, Denver 2, Colorado.

W. A. Dexheimer,
Commissioner

OFFICIAL PROPOSALS

Bids: January 29, 1957

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
CHANNEL ENLARGEMENT, VICINITY OF CARDINAL

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked

"TENDER FOR ST. LAWRENCE POWER PROJECT CHANNEL ENLARGEMENT, VICINITY OF CARDINAL"

will be received up to 4.30 o'clock p. m., Eastern Standard Time, on

TUESDAY, JANUARY 29, 1957

for approximately 1,645,000 cubic yards of common excavation and approximately 20,000 cubic yards of solid rock excavation.

The work comprising clearing, wet and dry excavation, and disposal of materials shall commence fifteen (15) calendar days after notice of the award of the contract and shall be completed by December 15, 1959.

Copies of the tendering documents may be obtained on or after Wednesday, December 19, 1956, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of twenty-five dollars ($25.00) for each set. This charge will not be refunded.

Tendering documents may be inspected at the above address and at the offices of the following: the Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.

Each tender must be accompanied by a certified cheque drawn on a Canadian chartered bank for a sum calculated as follows: On tenders up to $500,000.00 the sum shall be 10 per cent of the total amount of the tender; on tenders over $500,000.00, the sum shall be 10 per cent of the first $500,000.00 and 5 per cent of the excess over $500,000.00. Provision for the return of the cheques appears in the tendering documents.

The successful tenderer will be required to furnish a performance bond in the form approved by the Commission and issued by a bonding company licensed as such in the Province of Ontario and acceptable to the Commission for one hundred per cent (100%) of the total amount of the contract.

The lowest or any tender will not necessarily be accepted.

E. B. EASSON
SECRETARY

Bids: January 10, 1957

The Illinois State Toll Highway Commission

NORTHERN ILLINOIS TOLL HIGHWAY
NORTH ILLINOIS ROUTE
CONTRACT N-6B CONTRACT N-6C
CONTRACT N-6BC

ADVERTISEMENT FOR BIDS

Sealed Proposals will be received by The Illinois State Toll Highway Commission at the office of the Commission, 20 North Wacker Drive, Chicago 6, Illinois, until 11:00 o'clock A.M., Central Standard Time, on Thursday, January 10, 1957, and immediately thereafter will be taken to the Bernard Shaw Room of the Sherman Hotel, Randolph and Clark Streets, Chicago, Illinois, and publicly opened and read aloud.

Prospective bidders are hereby informed that the first sentence of Section 314a 38 of Chapter 121 of the Illinois Revised Statutes provides that—

"All contracts let for the construction of any work authorized to be done under the provisions of this Act where the amount thereof is in excess of the sum of $1,000, shall be let to the lowest responsible bidder or bidders on open competitive bidding after public advertisement made at least fifteen days prior to the opening of bids, in a newspaper of general circulation published in each of the seven largest cities of the State, as determined by the last preceding Federal census in such manner and at such intervals as may be prescribed by the Commission."

The work to be done under these Contracts shall be commenced on April 1, 1957, or on such earlier date as may be mutually agreed upon between the Commission and the Contractor. All work under this Contract shall be completed on or before July 31, 1958.

CONTRACT N-6B

The work to be done under this Contract consists of:

The grading, drainage, paving, the construction of appurtenances and the erection of steel and precast concrete bridges for approximately 4.64 miles of the Northern Illinois Toll Highway in Construction Section N-6B, beginning at a point about 1,700 feet east of Bartlett Road at Northern Illinois Toll Highway centerline Station 2385+00 in Hanover Township, Cook County, Illinois, and extending easterly to a point about 1,000 feet west of Roselle Road at Northern Illinois Toll Highway centerline Station 2630+00 in Schaumberg Township, Cook County, Illinois.

The approximate quantities of the principal items of work are as follows:

Item	Approximate Quantity
Roadway Excavation	995,000 Cu. Yds.
Special Excavation	250,000 Cu. Yds.
Special Fill	160,000 Cu. Yds.
Class M Concrete	4,000 Cu. Yds.
Reinforcing Steel	607,500 Lbs.
Structural Steel (Erection only)	1,258,400 Lbs.
Selected Subgrade	97,000 Cu. Yds.
Granular Subbase	50,000 Cu. Yds.
Reinforced PCC Pavement—10"	161,000 Sq. Yds.
Bituminous Concrete Shoulders	81,000 Sq. Yds.

CONTRACT N-6C

The work to be done under this Contract consists of:

The grading, drainage, paving, the construction of appurtenances, and the erection of precast concrete bridges for approximately 4.38 miles of the Northern Illinois Toll Highway in Construction Section N-6C thereof, beginning at a point about 1000 feet west of Roselle Road at Northern Illinois Toll Highway centerline Station 2630+00 in Schaumberg Township, Cook County, Illinois, and extending easterly to a point 780 feet south of Golf Road at Northern Illinois Toll Highway centerline Station 2861+17.01 in Elk Grove Township, Cook County, Illinois.

The approximate quantities of the principal items of work are as follows:

Item	Approximate Quantity
Roadway Excavation	431,000 Cu. Yds.
Borrow	808,000 Cu. Yds.
Selected Subgrade	106,000 Cu. Yds.
Granular Subbase	59,000 Cu. Yds.
10" Reinforced PCC Pavement	175,000 Sq. Yds.
3" Bituminous Concrete Shoulders	98,000 Sq. Yds.
Right-of-Way Fence	50,000 Lin. Ft.
Structure Concrete	7,800 Cu. Yds.
Reinforcing Steel	1,214,000 Lbs.

CONTRACT N-6BC

The work to be done under this Contract, which covers a combination of Contracts N-6B and N-6C, consists of the construction as above described for those individual Contracts taken together.

Copies of the Plans, Specifications, Proposal Forms and other Contract Documents for said Contract are available for public inspection or purchase at the office of the Chief Engineer, The Illinois State Toll Highway Commission, Room 1654, 20 North Wacker Drive, Chicago 6, Illinois. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

Standard Specifications for Northern Illinois Toll Highway	$ 5.00
Proposal Form, Special Provisions and other Contract Documents, per copy	$ 5.00
Plans, per set, per construction section	$25.00

All Proposals must be on the forms prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

A Contractor's Financial Statement and Experience Questionnaire, a Plan and Equipment Questionnaire, and a Statement of Current Contractural Obligations on forms supplied by the Commission will be required from all bidders.

Each Proposal must be accompanied by a Proposal Guaranty in the amount of five (5) per cent of the total amount shown in the Proposal for the Contract, provided that the Proposal Guaranty will not be required in an amount exceeding $250,000. The Proposal Guaranty shall be in the form of an acceptable bid bond or a bank draft, certified check or cashier's check drawn on a solvent bank made payable to The Illinois State Toll Highway Commission.

If the bidder is an individual or partnership doing business under an assumed name he or it shall be required to furnish prior to or at the time of submission of his first proposal a certificate showing that such individual or partnership is registered and authorized to conduct business in Illinois under such assumed name in accordance with Paragraph 4, Chapter 96, of the Illinois Revised Statutes, 1955.

If the bidder is an out-of-State corporation, it shall be required to furnish, prior to or at the time of submission of its first proposal, a certificate from the Secretary of the State of Illinois as evidence that the corporation has complied with the Illinois Foreign Corporation Statutes, and that the Corporation is authorized to transact business in the State of Illinois.

The award of the above contracts, if any award be made, will be to the lowest responsible bidder or bidders. The Commission reserves the right to reject any and all proposals and to waive technicalities.

THE ILLINOIS STATE TOLL HIGHWAY COMMISSION
By Austin L. Wyman, Chairman

December 18, 1956

Bids: January 24, 1957

Construction of Water Transmission Main

ADVERTISEMENT

Notice is hereby given that sealed bids will be received in accordance with the law by the Erie County Water Authority until ten o'clock A. M. Eastern Standard Time on the twenty-fourth day of January, 1957 at the office of the Authority, 338 Ellicott Square Building, Buffalo 3, New York, for furnishing materials and performing the labor for constructing a forty-two (42") inch diameter water transmission main in the Towns of Hamburg and Evans, Erie County, New York, all in accordance with plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New Kork 3, New York.

Copies of the plans and specifications may be obtained either from the Erie County Water Authority or from the Consulting Engineers upon deposit of Twenty-Five ($25.00) Dollars, which sum will be refunded upon return of the plans in good condition within ten (10) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be done includes all materials and labor, tools, plant and equipment necessary for constructing, installing, testing and completing, ready for operation, approximately thirty four thousand (34,000') feet of forty-two (42") inch diameter water transmission main connections to existing mains, valves, air relief and blow-off facilities, manholes and other accessories and appurtenances.

Each proposal must be accompanied by a certified check payable to the Erie County Water Authority or a bid bond to the favor of the Authority from a reliable surety company authorized to do business in the State of New York and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bonds will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for twenty (20) days after their receipt before awarding any contract and the right is reserved to accept any bid or to reject any or all of them.

ERIE COUNTY WATER AUTHORITY
By: WILLIAM J. CARNEY
Secretary

Buck, Seifert and Jost
Consulting Engineers

Dated: December 20, 1956.

EMPLOYMENT OPPORTUNITIES

DISPLAYED

The advertising rate is $31.80 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

—RATES—

UNDISPLAYED

$2.10 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box Numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to Agency Commission.

Send NEW ADS and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36. January 24th issue closes January 14th

HYDRAULIC ENGINEERS

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State Personnel Board
801 Capitol Ave., Sacramento, California

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Opportunity for sales engineer work for energetic young engineer or construction man. 25 to 35 years of age for sales work in established territory with company operating on nation-wide basis furnishing metal forms for sale or rent to handle concrete forming work. General construction experience or some civil engineering training desirable. Must want to sell. Give full details of background and experience in first letter to W. H. Witt.

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Experienced on Highways and Bridges to work for a progressive and expanding construction company, man of/or with good references desired. Please send complete resume to:

FISCHER CONSTRUCTION COMPANY
4053 Clifton Ave. Cincinnati 20, Ohio

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Assist. Prof.—To teach undergrad. courses in structures and applied mech. Salary depends on qualifications. Dept. of Civil Eng., Univ. of No. Dakota, Grand Forks, N. Dak.

Office Engineer and Assistant Engineer (two positions), desired for progressive Class 1, New England Railroad. Immediate placement for men with proper qualifications. State age, references, experience, education, salary required, when applying. All correspondence confidential. P-3730, Engineering News-Record.

Designers—Steel, Concrete, Electrical Piping. Air-Cond., Power Plants & Industrial Bldgs. Marbarry Corp., 120 Greenwich St., N.Y.C. Rector 2-3749.

Civil Engineers. Designers. Draftsmen experienced in the design of sewers pumping stations, sewage treatment plants, water supply systems, structural and hydraulic design, hydraulic computations, specs. O'Brien & Gere, 400 E. Genesee St., Syracuse, N. Y.

Sales Engineers to introduce outstanding product in sanitary and drainage fields. Young, aggressive, well-financed company. Salary open. Location: Gulf Coast. P-3773, Engineering News-Record.

Construction Superintendent for college construction in central New Hampshire. Excellent compensation. Only top notch man will be considered. Reply to P-3777, Engineering News-Record.

Civil Engineer-Estimator: for industrial construction. Approximately 10-15 years of both estimating and job experience. Salary open, position permanent. Located in Florida. P-3632, Engineering News-Record.

Construction superintendent wanted for work in Florida to handle large highway, grading, paving and drainage projects. Must be experienced in preventative maintenance of heavy equipment. Give references and salary desired. P-3815, Engineering News-Record.

Graduate engineer with some precast concrete experience desired by a manufacturer to take charge of a precast department. Send complete application, including education, past experience, references, and salary expected. Location, Norfold, Virginia. P-3797, Engineering News-Record.

Manufacturing Engineer—Nationally known expanding manufacturer has several Production Engineering openings for young graduate Mechanical or Electrical Engineers with 2-3 years engineering experience in industry. Positions involve development of new manufacturing methods, cost reduction, new product development, and manufacturing operations control. Unusual opportunity for intelligent aggressive young man who finds himself limited for further advancement and desires more challenge and responsibility. In confidential letter give complete details on age, education, experience, and salary required. P-3703, Engineering News-Record.

Structure Superintendent: Capable of organizing a profitable operation on multi-structure highway and related work. Should have a following of proven key men. Send complete employment record, personal history and salary requirement in the first letter. P-3866, Engineering News-Record.

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Estimator or Quantity Surveyor wanted living in or near New York City to work at home on part-time or full-time basis. Qualifications must be: Accuracy with better than normal speed; experience to take off quantities for general contractors on large or medium-sized buildings. We pay professional rates and will keep all answers in strict confidence. P-3852, Engineering News-Record.

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Estimator—engineer for est. G/C in North N. J., industrial and commercial bldgs. and govt. work. Write exp., salary. P-3860, Engineering News-Record.

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(Continued on page 88)

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Architectural Designers—Draftsmen
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Civil Engineering Draftsmen
Jackson, Miss.

Ink Tracers—Computors
Rochester, Pa., Jackson, Miss.

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Industrial Relations Division

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Recruiting Offices in New York, Los Angeles, San Francisco and Houston

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One highway engineer with previous experience in designing, supervising and coordinating staff of design engineers. Salary $7200 to $8400

Three to five experienced highway structures and bridge design engineers. Salary $6000 to $7200

Three to five experienced highway design engineers. Salary $6000 to $7200

Send full resume of experience, date of availability and other pertinent data. All replies confidential if requested.

P-3843, Engineering News-Record,
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Excellent opportunity with consulting engineering firm in Middle West. Liberal benefit plans and good working conditions.

Send resume of education and experience with statement of salary requirements to:

P-3222, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

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Immediate Employment

Starting positions in California's highway expansion program. $436/mo. to start, with first raise after 6 months. Subsequent promotional opportunities to higher level positions. Open to recent college graduates in civil engineering. Write for illustrated booklet: C. S. WARNER, Supervisor, Section E, State Personnel Board, 801 Capitol Avenue, Sacramento 14, California.

SAN FRANCISCO City and County

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Assistant Engineer I (Civil)	$500—$600

For Further Information and Applications Inquire:

San Francisco Civil Service Commission

154 City Hall

San Francisco, California

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Wanted by manufacturer of tubular steel piles. Experience in pile foundation construction necessary. Service work involves travel from central headquarters. Position is permanent and offers good opportunity for advancement. Salary commensurate with useful experience. Mail personal and experience record to

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CANTON, OHIO

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HARZA ENGINEERING CO.

400 W. Madison St. Chicago 6, Ill.

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FOR HIGHWAY BRIDGE WORK

In New York City and New Jersey

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44 Cooper Street, Woodbury, New Jersey

CIVIL ENGINEER

Young civil engineer interested in broad application of civil engineering.

Excellent opportunity with consulting firm. Liberal benefit plans and good working conditions. Location Middle West.

Send resume of education and experience with salary requirements to:

P-3223, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

STRUCTURAL ENGINEER:

Graduation from a college or university of recognized standing with a degree in engineering, specializing in structural engineering, and 5 years experience in a responsible capacity involving design of all sizes and classes of buildings and structures or an equivalent combination of experience and training. Salary $5980-$7020 per year. Complete details by writing to Director of Personnel, Municipal Building, Hartford, Conn.

STRUCTURAL ENGINEER

Large New England fabricator has permanent position for young structural engineer—position will eventually lead to Chief of Engineering Department. Must have Conn. C.E. license or qualifications to take examination. Give full qualifications in letter.

P-3750, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

POSITION AVAILABLE

GRADUATE STRUCTURAL ENGINEER with minimum of three years experience in structural design office. Age 30 to 40 years. Headquarters Chicago. No traveling. Opportunity for advancement. Salary open.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue Chicago 10, Illinois

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Director of Personnel
West Virginia Pulp & Paper Company
Luke, Maryland

POSITIONS WANTED

(Continued from page 86)

Materials or Paving Engineer with ten years experience in soils, asphalt, concrete design, and quality control, desires overseas employment on airfields, roads, or dams. PW-3804, Engineering News-Record.

Engineer, registered, aggressive—8 years mech-struct design and installation, desires responsible position with Engineer, Contractor, or multi-plant mfr. Present salary 8000. Request Resume. PW-3794, Engineering News-Record.

Architectural-engineer, 8 yrs. architectural, structural design; supervision, 3½ yrs. So. America. Graduate registered architect. Married, 37. Prefer South, Southwest. Overseas. PW-3723, Engineering News-Record.

Construction Superintendent; industrial, commercial, institutional; large scale housing, etc; 25 years field supervision. Similar position desired offering long range opportunity, will travel, res. of N. J. PW-3865, Engineering News-Record.

Construction Superintendent past 2½ years on lump sum government work for Philadelphia General contractor desires job. PW-3844, Engineering News-Record.

Supt. or Project Manager available for work in Florida or Georgia. Qualified and experience all phases. PW-3822, Engineering News-Record.

Civil Engineer SM—MIT 10 years in design and hydro and chemical plant construction. Now in Jamaica. Available May. PW-3861, Engineering News-Record.

Civil Engineering Professor available. Major interest in highway and canstruction subjects. BSCE and professional CE degrees. 22 years municipal and highway engineering and construction. 9 years teaching civil engineering. PW-3854, Engineering News-Record.

Field Superintendent, 47, 11 years supervising all projects for midwest contractor, volume over $1 million yearly, commercial & industrial, desires similar position with more long-range opportunity. Go anywhere. Investment opportunity desirable. PW-3851, Engineering News-Record.

Civil Engr. 32 Field & Office constr. exper. New York area. PW-3829, Engineering News-Record.

Personnel Managers—Need experienced Engineers and Technicians? We offer a booklet especially prepared to help you solve this problem. Write for your "free" copy of "Reservoir of Engineers and Technical Men." Engineering News-Record, P. O. Box 12, New York 36, N. Y.

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(Continued on pages 89-94)

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CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

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WANTED

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802 Lima Cranes
604 Lima Combination Shovel-Crane
25 Northwest Combination Shovel-Crane
80-D Northwest 2½ yard Shovel
3000-B Manitowoc 2 yard Shovel
38-B Bucyrus Erie 1½ yd. Shovel
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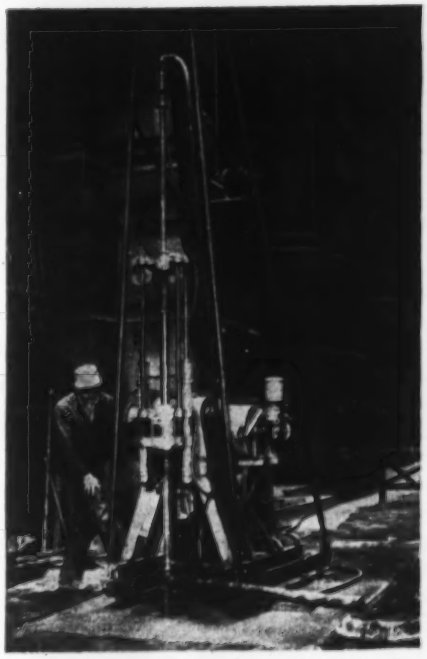

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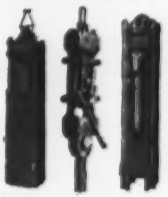

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Hope For More Steel

THE ANNOUNCEMENT by the Bethlehem Steel Company that it is ready to spend a quarter of a billion dollars in an expansion of its capacity to make structural shapes and plates is about the best news a dawning New Year could bring. To a construction industry harassed and, in places, even halted by a shortage of this vital product, the prospect of this effective interest in its troubles will be welcomed with enthusiasm. For there has not been much encouragement for construction in most capital spending announcements from the steel industry, which have emphasized products other than structurals.

Bethlehem, it is worth noting, has recently completed an increase in the annual structural capacity of its Saucon Division from 1.7 to 2.5 million tons. The proposed new expansion is in the Lackawanna, N. Y. plant, and amounts to roughly 1 million tons. But whether it actually goes ahead is said to hinge on whether the government will approve rapid tax amortization of the cost. In view of the real need for structural steel, it is hoped that the government will reconsider and reverse its decision not to grant this kind of special tax aid to the steel industry. It will cost the government and the economy nothing, whereas a big enough raise in steel prices to pay for the necessary expansion will be inflationary in the extreme.

The need for more structural capacity is, of course, highlighted by the huge roadbuilding program just getting under way. To this must now be added increased demand from the shipbuilding industry for new tankers to supply the world with oil if the Suez Canal and the Middle East pipelines are to continue to be of uncertain usefulness. This tanker program will unfortunately compete with construction for the steel available. And it should not be overlooked that the steel industry itself will require large tonnages of structural shapes and plates to build its own expanded facilities.

This latter demand—for structural steel to construct facilities to produce more structural steel—will naturally deny some of the new output to other types of construction temporarily. However, this is a delay to be accepted gladly, so long as there is tangible prospect that more structural steel is on the way.

On this score, the steel industry has maintained all along that its constantly increasing ability to turn out more basic steel is in reality a firm foundation for more structural production. Once it has the necessary bloom and billet capacity—and that should occur sometime this year—structural rollings can be stepped up.

As to general steel expansion, the annual survey of capital spending by the McGraw-Hill Department of Economics shows that the industry, which spent $879 million in 1955 and $1,257 million in 1956, has scheduled a $1,659 million expenditure for 1957, a 32% increase. With Bethlehem the first to announce that a large chunk of its money will go into more structural steel production, it is hoped that other companies will be induced to do likewise. Then, with adequate basic steel available, and a concerted effort to turn more of it into shapes and plates, some easing of the structural steel shortage should occur before the end of 1957. The prospects for 1958, in turn, should be good indeed.

A Million Housing Units

THE WORD FROM WASHINGTON is that a million new housing starts this year will be "satisfactory". Obviously, this means that it will be satisfactory so far as the economy is concerned. What builders think who paced their plans on the hope that recent boom years of 1.3 million units were normal years is something else.

Plainly, however, a million new housing units is a sizable piece of construction. It is probably $15 billion worth. Moreover, 1956 was the seventh straight year when more than a million new units were added to our housing inventory. Under such circumstances the housing deficit with which we started after the war was bound to be reduced, if not disappear.

The immediate cause of the drop-off, however, has been a lack of loan money brought on by the low interest rates attached to VA and FHA mortgages. Available money has gone into higher interest bearing loans than these government-controlled mortgages represent. And nothing can change this short of more direct government buying of mortgages.

With the government showing no disposition to take such extreme measures, so long as a million units can be assured without them, housing plans must be geared to this figure. Actually, it is by no means a "depression" figure as some would make believe. And it may be a very sensible one in view of the inflationary effect on materials supplies and prices, which could occur from too much artificial stimulation of additional housing.

During the past year, the 200,000 unit loss over the earlier boom years has been almost entirely centered in the lower cost homes represented by VA and FHA loans. This type of housing was off 30% compared with only a 1% drop in homes not financed with government-guaranteed mortgages. It seems likely that this pattern of homebuilding—that is, tending to the higher priced brackets—will continue in 1957. Congress may take some steps to improve the veteran housing prospects slightly, but there is little feeling in Washington that they will change the picture appreciably.

In any event, a million housing units a year should keep this segment of construction healthy, if not booming. And the fact that this amount of housing is practically guaranteed by government policy is not to be overlooked as a stabilizing factor of real value.

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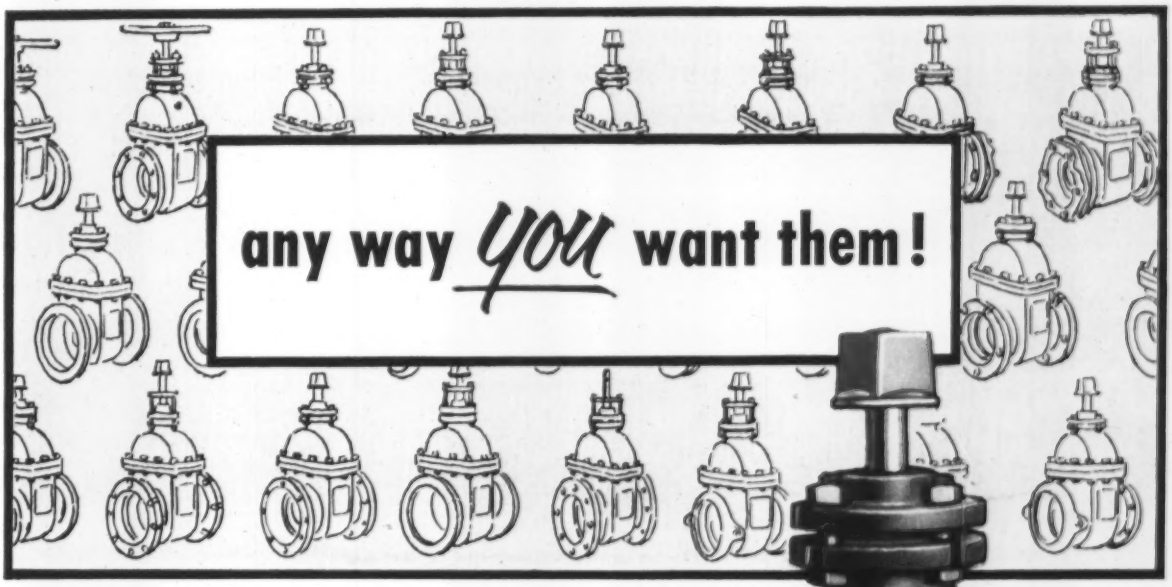

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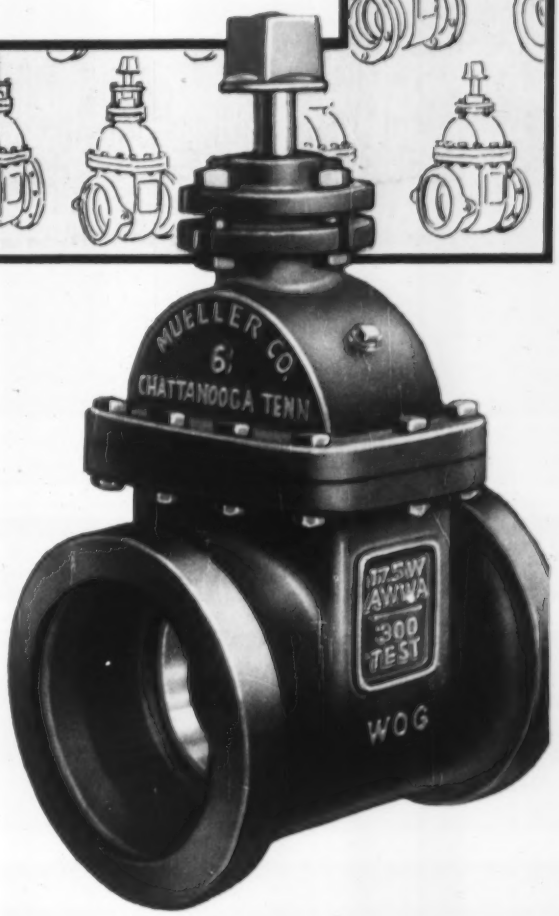

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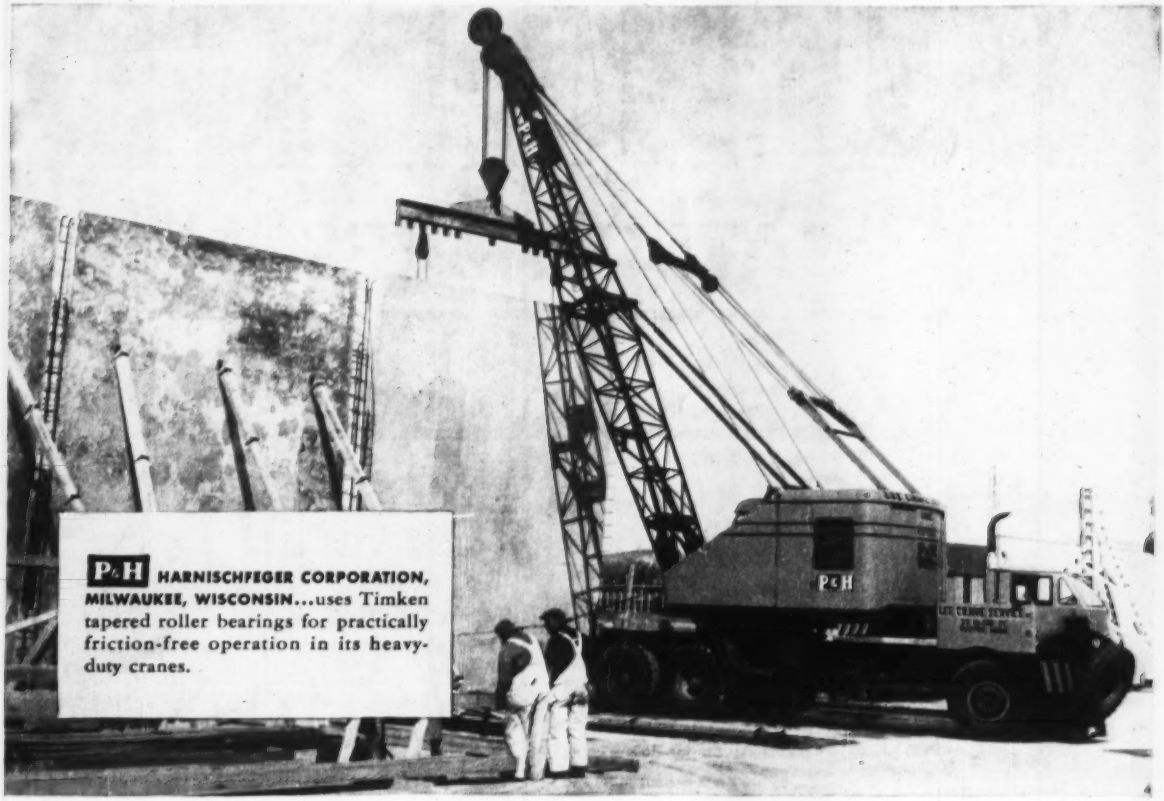
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